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ABSTRACT

This report gauges progress toward achieving high quality teaching in every classroom, using data about teaching conditions that are new since publication of an earlier report by the National Commission on Teaching and America's Future. Section 1, "Doing What Matters Most: Investing in Quality Teaching," describes the Commission's original findings and recommendations following two years of study. Findings indicate that most schools and teachers cannot achieve new educational goals because they do not know how and do not receive support to do so. Recommendations include linking teacher standards to student standards, reinventing teacher preparation and professional development, overhauling teacher recruitment, putting qualified teachers in every classroom, and organizing schools for success for all. Section 2, "America's Agenda for Education," discusses new standards and new students in America's schools, examining why and how teaching matters. Section 3, "Lessons from Last Decade's Reforms," discusses major initiatives in North Carolina, Connecticut, and other states for improving teaching quality. Section 4, "The Current Status of Teaching," discusses teacher recruitment and teacher supply and demand; salaries and working conditions; retention; qualifications and training; reform of teacher education and induction; access to professional development; and progress in school reform. Section 5, "Evidence of Progress," describes federal, state, and local initiatives to improve quality. Six appendixes offer state report cards on teacher quality; state-by-state data tables; National Council for the Accreditation of Teacher Education, Interstate New Teacher Assessment and Support Consortium, and National Board standards; Commission staff, advisors, and consultants; partner state contact persons; and national organization partners and contact persons. (SM)

Doing What Matters Most: Investing in Quality Teaching

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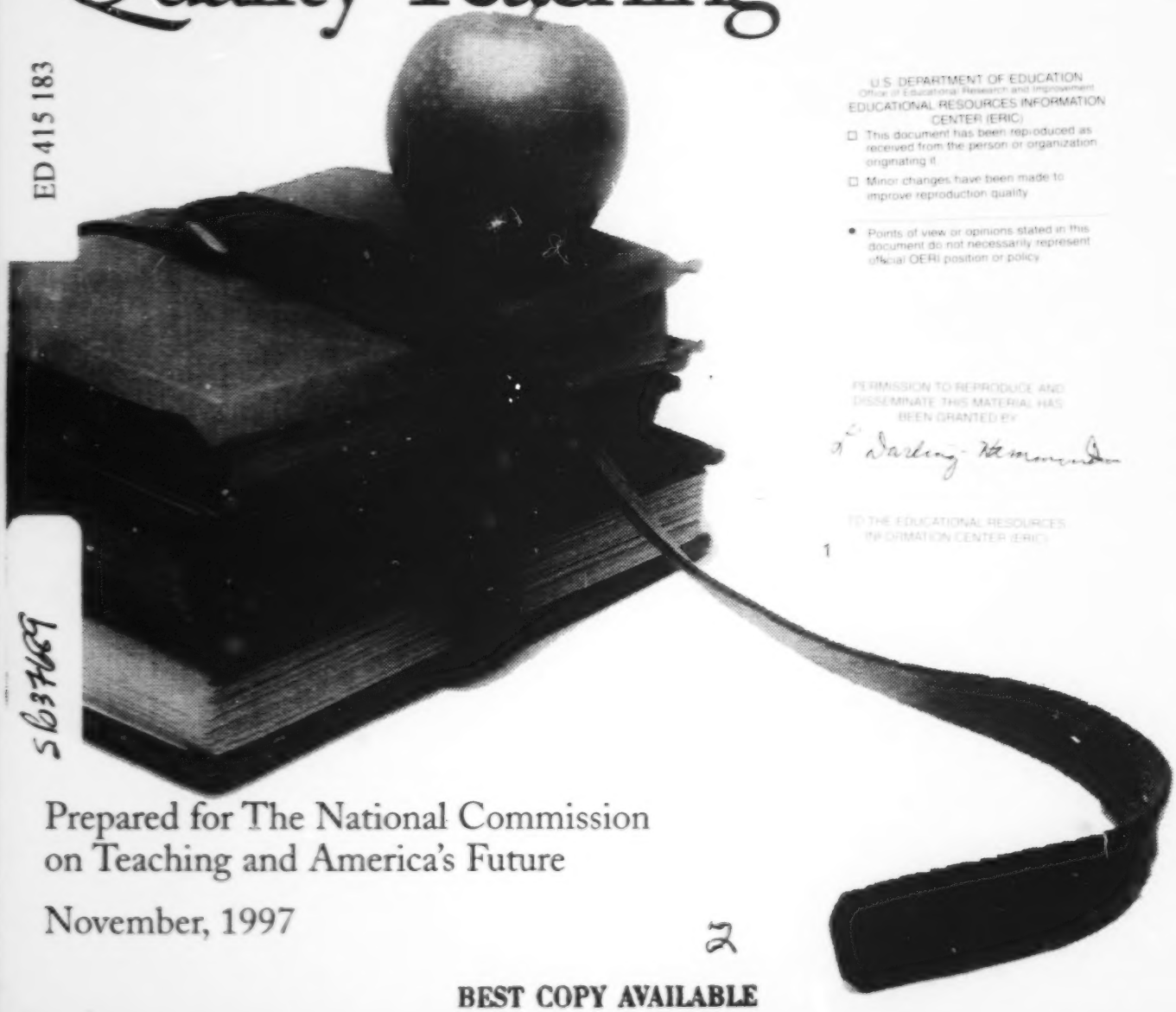

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The Commission was created to identify the implications for teaching embodied in current school reforms; to examine what steps need to be taken to guarantee all children access to skilled, knowledgeable, and committed teachers; and to develop a comprehensive blueprint for recruiting, preparing, and supporting a teaching force that can meet 21st-century standards of high educational performance. The Commission's report, *What Matter Most: Teaching for America's Future*, was released in September 1996.

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Doing What Matters Most: Investing in Quality Teaching

Prepared for The National Commission on Teaching and America's Future

by Linda Darling-Hammond
Executive Director

November, 1997

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Preface and Acknowledgments

One year ago the National Commission on Teaching and America's Future issued its report, *What Matters Most: Teaching for America's Future*. Like most reports of its kind, this one was launched at a press conference which received substantial attention from the media. Since then, however, the report has not been abandoned to a dusty shelf. Much more has occurred. A group of states have joined forces to seek to implement the report's recommendations. National organizations of policymakers and practitioners, having endorsed the report, are working with their members on strategies to improve teaching standards and teacher professional development. Commissions on teaching have been formed in many communities, and steps are underway to change policies, programs, and practices in statehouses and schoolhouses.

The National Governors Association and the National Conference of State Legislatures have helped their members examine policy strategies to improve the quality of teaching. The National Education Association has endorsed peer review and assistance programs to improve teaching and strengthen teacher accountability. The American Federation of Teachers had worked to link student standards to teaching standards. The Council for Basic Education and the American Association of Colleges for Teacher Education have launched a project to redesign teacher education in light of student content standards. The Association for Teacher Educators has developed standards for teacher educators. Local school districts have developed initiatives to improve teacher recruitment and teaching conditions as well as teachers' access to knowledge. The American Association of School Personnel Administrators has begun studies of effective teacher recruitment and personnel practices. Recruiting New Teachers, the Council of Great City Schools, the Holmes Partnership, the Teacher Union Reform Network, and the National Urban League are developing collaborative projects with the Commission to improve teacher recruitment and development in urban and poor rural school districts. And the U.S. Department of Education has launched two major research centers to study how to enhance teaching excellence.

This follow-up report, *Doing What Matters Most: Investing in Quality Teaching*, seeks to gauge the nation's progress toward the goal of high-quality teaching in every classroom in every community. It draws on data about the conditions of teaching that have become available since the original Commission report was released, and it examines policy changes that have occurred.

The research presented here is the product of many people's efforts. Deborah Ball coauthored portions of this text. Ronald Ferguson of the Harvard Kennedy School graciously provided detailed information about his analyses of student achievement. Richard Ingersoll conducted extensive analyses of the U.S. Depart-

ment of Education's Schools and Staffing Surveys. Barnett Berry collected and analyzed data on state policies and practices. Dylan Johnson of the Commission's staff and Craig Jerald, Bridget Curran, Nancy Waymack, Karen Abercrombie, Kimberley Campbell, and Rachel Henighan of Education Week assisted in data collection. Eric Hirsch of the National Conference of State Legislatures assembled data on state legislation related to teaching. Marilyn Rauth, Ellalinda Rustique-Forrester, and Jon Snyder contributed to data analyses and writing. Stephen Broughman and Kerry Gruber of the National Center on Education Statistics ferreted out NCES data and answered critical questions. Flynn Marie Pritchard designed a panoply of tables and graphics. Deanna Knickerbocker of the Center for Advanced Study in the Behavioral Sciences developed additional beautiful graphics. Andy Bornstein designed the report with great speed and skill. Matthew Forrester designed the appendices. Margaret Garigan and Connie Simon assisted in assembling portions of the report.

The Rockefeller Foundation and Carnegie Corporation of New York have continued to provide major financial support for ongoing implementation of the Commission's work. The Ford Foundation has provided funds for an intensive nationwide effort to improve teaching in urban and poor rural schools. The U.S. Department of Education's National Institute on Educational Governance, Finance, Policymaking and Management has supported research and networking among the Commission's partner states. The AT&T Foundation supported the Commission's website and videotape. Support for specific state and regional efforts has been provided by the Bellsouth Foundation, the Georgia Power Company, the John D. and Catherine T. MacArthur Foundation, the Pew Charitable Trust, Philip Morris Companies Inc., and the William R. Kenan Jr. Charitable Trust.

All of these organizations and individuals have made important contributions to this work. The most important contributions, however, were and will be made by the teachers, parents, students, and community leaders and policy makers who are doing what matters most: working with each other to improve teaching and learning.

Doing What Matters Most: Investing in Quality Teaching

"We propose an audacious goal.... By the year 2006, America will provide every student with what should be his or her educational birthright: access to competent, caring and qualified teaching."
—What Matters Most: Teaching for America's Future[1]

With these words, the National Commission on Teaching and America's Future summarized its challenge to the American public in September, 1996. The Commission sounded a clarion call to place the issue of teaching quality squarely at the center of our nation's education reform agenda, arguing that without a sustained commitment to teachers' learning and school redesign, the goal of dramatically enhancing school performance for all of America's children will remain unfulfilled.

Following two years of intense study and discussion, this blue-ribbon panel of education, community, and business leaders concluded that an impasse has been reached in school reform: Most schools and teachers cannot achieve the goals set forth in new educational standards, not because they are unwilling, but because they do not know how, and the systems they work in do not support them in doing so. The Commission's report offered a blueprint for transforming how teachers and principals are prepared, recruited, selected, and inducted, and how schools support, assess, and reward their work.

The publication of the Commission's report marked the tenth anniversary of a set of reports that first drew the nation's attention to the importance of teachers and teaching, including the Carnegie Forum's *A Nation Prepared: Teachers for the 21st Century* and the Holmes Group's *Tomorrow's Teachers.* The Commission's recommendations built upon these prior reform efforts, highlighted initiatives that work, and described how these can become building blocks for a comprehensive system that supports high quality teaching.

Since that time, the report and the Commission's subsequent work have stimulated dozens of pieces of federal and state legislation, a wide array of local initiatives to improve teaching, more than 1500 news articles and editorials nationally and abroad, and at least two federally-funded research and development initiatives which bring together researchers, professional associations, policy makers, and practitioners to enhance knowledge and practice in the fields of teaching and policy.[2]

Twelve states are working with the support of the Commission and the participation of their governors, state education departments, legislative leaders, and business and education leaders to develop strategies for improving the quality of teaching. They include: Georgia, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Missouri, Montana, North Carolina, Ohio, and Oklahoma. Several others will join this group of partner states in the coming year.

This report revisits the Commission's recommendations, offers new data about how investments in teaching influence student achievement, and provides an overview of the nation's progress toward quality teaching.

The Commission's Findings

In *What Matters Most: Teaching and America's Future*, the Commission described aspects of teaching in the United States that had barely been known to the public. While teachers' knowledge and skills powerfully influence student learning, the United States has no real system in place to ensure that teachers get access to the kinds of knowledge they need to help their students succeed. At the same time, demand for new teachers is escalating—more than two million teachers will need to be hired over the next decade—so the nation's ability to place highly-qualified teachers in all classrooms will depend on proactive policies that increase both the quantity and quality of teachers.

The Commission revealed that more than one-quarter of newly hired public school teachers in 1991 lacked the qualifications for their jobs, and nearly one-fourth (23%) of all secondary teachers did not have even a minor in their main teaching field. Fifty-six percent of high school students taking physical science were being taught by out-of-field teachers, as were 27% of those taking mathematics and 21% of those taking English. The least qualified teachers were most likely to be found in high-poverty and predominantly minority schools and in lower-track classes. In fact, in schools with the highest minority enrollments, students had less than a 50% chance of getting a science or mathematics teacher who held a license and a degree in the field he or she taught.

At the same time, the Commission's analysis revealed that many states' and districts' licensing and hiring practices are out of synch with new student standards and with the expanding diversity of students entering our schools. Furthermore, the nation lacks systems to attract and retain the kinds of teachers needed for high demand fields and locations. Rather than creating policies to address shortages, standards are too often waived or lowered to admit people without qualifications to teach. Much preservice teacher education is thin and fragmented; standards for schools of education are unevenly applied; many beginning teachers receive little or no mentoring; and teacher evaluation and reward systems are disconnected from the nation's education goals.

In addition, professional development investments are fairly paltry, and most districts' offerings, limited to "hit and run" workshops, do not help teachers learn the sophisticated teaching strategies they need to address very challenging learning goals with very diverse populations of students. Most school districts do not direct their professional development dollars in a coherent way toward sustained, practically useful learning opportunities for teachers. And teachers have little time to learn from one another: In U.S. schools, most teachers have only 3 to 5 hours a week in which to prepare their lessons, usually in isolation from their colleagues. They rarely have opportunities to plan or collaborate with other teachers, to observe and study teaching, or to talk together about how to improve curriculum and meet the needs of students. In short, many U.S. teachers enter the profession with inadequate preparation, and few have many opportunities to enhance their knowledge and skills over the course of their careers.

By contrast, most nations we might consider peers or competitors hire far more teachers, prepare them more extensively, pay them more in relation to competing professional occupations, give them broader decision-making responsibility, and provide them with many more hours each week for joint planning and professional development. Many European and Asian countries support high-quality teaching by:

- pegging teachers' salaries to those of professionals like engineers or civil servants to avoid shortages of qualified personnel;
- subsidizing teacher preparation so that talented candidates can be recruited and offered a rigorous program of studies;

- requiring or encouraging graduate-level preparation in education on top of a bachelor's degree with one or more disciplinary majors;
- ensuring a year-long internship under the guidance of master teachers, in a school that works closely with the university teacher education program;
- requiring examinations of subject matter and teaching knowledge before entry into the profession;
- building extensive time for learning and collaborative planning into teachers' schedules so that they can work on teaching together.

In countries like Japan and China, teachers routinely work with their colleagues on developing curriculum, polishing lessons, observing each other's teaching, participating in study groups, and conducting research on teaching. In many countries, these activities are organized around a state or national curriculum framework, which is typically a lean instrument that outlines a relatively small number of major concepts and ideas to be treated, leaving to teachers the job of figuring out strategies for doing so that will work for their own students. (It is worth noting that U.S. texts and curriculum guides require the coverage of many more topics much more superficially than do curriculum frameworks in other countries, which emphasize in-depth learning about a smaller range of topics each year.)[3] In these countries, teachers have both a curriculum context and regular time to compare notes about particular lessons and problems, conduct demonstration lessons for one another, discuss how their students respond to specific tasks, and develop plans together.[4]

These nations are able to provide this kind of support for teachers because they allocate more of their organizational resources to teaching. In the United States, only 52% of education dollars are spent on instruction and only 43% of education staff are classroom teachers. In other industrialized nations, about three-fourths of education resources are spent directly on instruction, and classroom teachers represent from 60 to 80 percent of all staff.[5] Some restructured schools are beginning to reallocate their staff and other expenditures more directly to the classroom, with noteworthy results for student learning.[6] Resources are available in U.S. school systems to focus more effectively on quality teaching. They need to be redirected toward this end if America is to achieve its education goals.

The Commission's Recommendations

Drawing on a wide range of research findings and on examples of best practices from the U.S. and abroad, the Commission proposed a comprehensive set of recommendations that cover the entire continuum of teacher development. These proposals are intended to put the nation on a path to serious, long-term improvements in teaching and learning. They include:

I. **Standards for teachers linked to standards for students.** Clearly, if students are to achieve high standards, we can expect no less from their teachers and other educators. The first priority is reaching agreement on what teachers should know and be able to do in order to help students succeed at meeting the new standards. This task has recently been undertaken by three professional bodies that set standards for teacher education (the National Council for Accreditation of Teacher Education), beginning teacher licensing (the Interstate New Teacher Assessment and Support Consortium), and the advanced certification of accomplished veteran teachers (the National Board for Professional Teaching Standards). Their combined efforts to set standards for teaching linked to new student standards outline a coherent continuum of teacher development throughout the career. (See Appendix C for a summary of the standards.) To advance these

standards, the Commission recommends that states:

- Establish professional standards boards.
- Insist on professional accreditation for all schools of education.
- License teachers based on demonstrated performance of ability to teach to the new standards, including tests of subject matter knowledge, teaching knowledge, and teaching skill.
- Use National Board standards as the benchmark for accomplished teaching.

II. **Reinvent teacher preparation and professional development.** For teachers to have continuous access to the latest knowledge about teaching and learning, the Commission recommends that states, schools, and colleges:

- Organize teacher education and professional development around standards for students and teachers.
- Institute extended, graduate-level teacher preparation programs that provide yearlong internships in a professional development school.
- Create and fund mentoring programs for beginning teachers that provide support and assess teaching skills.
- Create stable, high-quality sources of professional development; then allocate one percent of state and local spending to support them, along with additional matching funds to school districts.
- Embed professional development in teachers' daily work through joint planning, study groups, peer coaching, and research.

III. **Overhaul teacher recruitment and put qualified teachers in every classroom.** To address teacher recruitment problems, the Commission urged states and districts to:

- Increase the ability of financially disadvantaged districts to pay for qualified teachers and insisting that school districts hire only qualified teachers.
- Redesign and streamline district hiring.
- Eliminate barriers to teacher mobility, by promoting reciprocal interstate licensing and working with states to develop portable pension systems.
- Provide scholarships and forgivable loans to recruit teachers for high-need subjects and locations.
- Develop high-quality pathways into teaching for recent graduates, mid-career changers, and paraprofessionals already in the classroom.

IV. **Encourage and reward knowledge and skill.** Schools have few means for encouraging outstanding teaching or rewarding increases in knowledge and skill. Uncertified entrants are paid at the same levels as those who enter with highly developed skills. Novices take on exactly the same kind of work as 30-year veterans. Mediocre teachers receive the same rewards as outstanding ones. Teachers must leave the classroom to get promoted. To address these issues, the Commission recommends that states and districts:

- Develop a career continuum and compensation systems that reward knowledge and skill.
- Enact incentives for National Board Certification.
- Remove incompetent teachers through peer assistance and review programs that provide necessary supports and due process.

V. Create schools that are organized for student and teacher success. In order to be able to direct their energies around a common purpose, schools need to adopt shared standards for student learning that become the basis for common efforts of teachers, parents, and the community. Then, schools must be freed of the tyrannies of time and tradition to permit more powerful student and teacher learning. This includes restructuring time and staffing so that teachers have regular time to work with one another and with shared groups of students; rethinking schedules so that students and teachers have more extended time together over the course of the day, week, and years; and reducing barriers to the involvement of parents so that families and schools can work together. To accomplish this, the Commission recommends that state and local boards work to:

- Reallocate resources to invest more in teachers and technology and less in non-teaching personnel.
- Select, prepare, and retain principals who understand teaching and learning and who can lead high-performing schools.
- Rethink schedules and staffing so that students have more time for in-depth learning and teachers have time to work with and learn from one another.

More recent evidence suggests that these recommendations are as germane today as they were a year ago, and ever more pressing if the United States is going to accomplish its goals for education.

America's Agenda for Education

New Standards and New Students

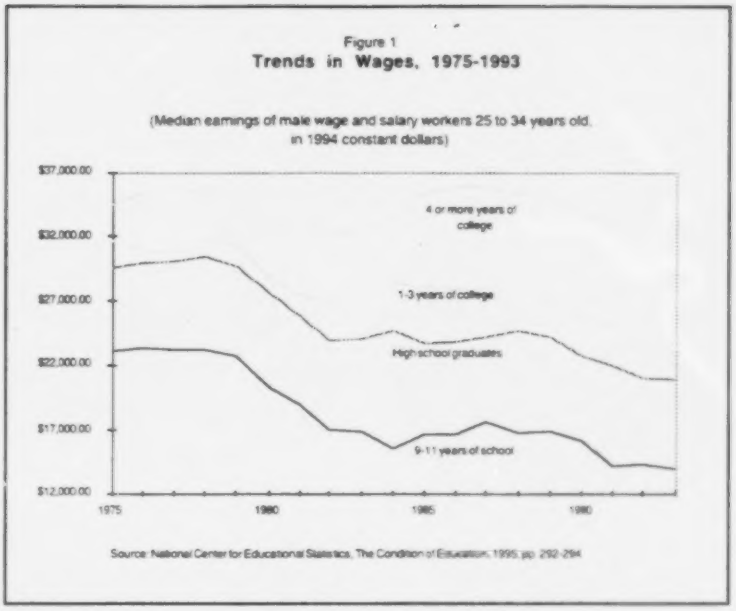
The education reform movement in the United States has focused increasingly on the development of new standards for students: Virtually all states have begun the process of creating more academically challenging standards for graduation, new curriculum frameworks to guide instruction, and new assessments to test students' knowledge. President Clinton has proposed a new national test, and many school districts across the country are weighing in with their own versions of standards-based reform, including new curricula, testing systems, accountability mechanisms, and promotion or graduation requirements.

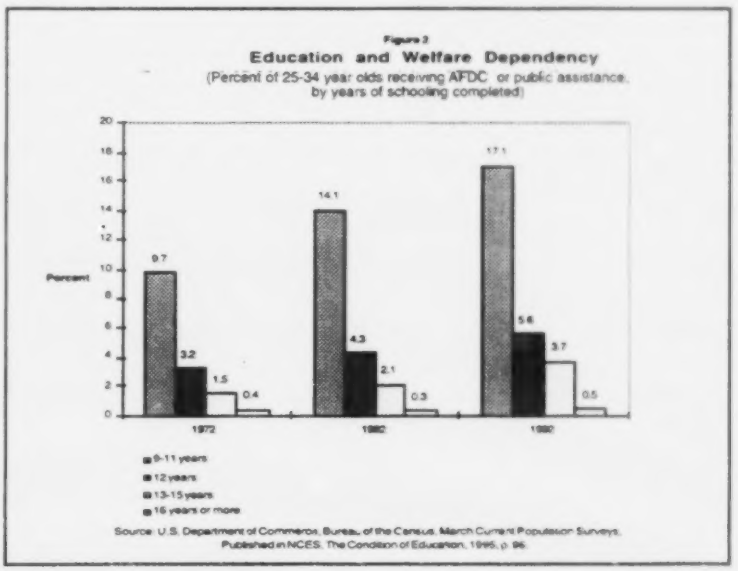
These efforts are stimulated by growing evidence that students will not succeed in meeting the demands of a knowledge-based society and economy if they do not encounter and master much more challenging work in school. By the first decade of the 21st century, nearly 50% of all jobs will require the higher levels of knowledge and skill once reserved for the education of the few. Only about 10% of jobs will offer the kind of routine work factories once provided for low-skilled workers, and these will pay far less than what such jobs offered only 20 years ago.[7] As figure 1 shows, only college-educated workers have come close to holding their own economically over the last two decades, while those with a high school education or less have steadily lost real income as previously well-paid factory jobs have become automated or moved overseas. Even among individuals with the same degrees, those with higher levels of skill increasingly have greater earning capacity. Surveys of employers indicate that even entry-level jobs require workers who have mastered higher levels of basic skills, are technologically literate, and can plan and monitor much

of their own work.[8]

Many workers have great difficulty moving into the more intellectually and interpersonally demanding jobs the new economy has to offer. As Peter Drucker notes:

> The great majority of the new jobs require qualifications the industrial worker does not possess and is poorly equipped to acquire. They require a good deal of formal education and the ability to acquire and to apply theoretical and analytical knowledge. They require a different approach to work and a different mind-set. Above all, they require a habit of continuous learning. Displaced industrial workers thus cannot simply move into knowledge work or services the way displaced farmers and domestic workers moved into industrial work.[9]





More than ever before in our nation's history, education is the ticket not only to economic success but to basic survival. Because the economy can no longer absorb many unskilled workers at decent wages, lack of education is increasingly linked to crime and welfare dependency. Women who have not finished high school are much more likely than others to be on welfare (figure 2), while men who have not succeeded educationally are much more likely to be incarcerated. Most inmates have literacy skills below those required by the labor market,[10] and nearly 40 percent of juvenile delinquents have learning disabilities that went untreated in school.[11]

National investments in the last decade have tipped heavily toward imprisonment rather than education. During the 1980s, prison populations more than doubled while expenditures for prosecution and corrections grew by over 900 percent.[12] During the same decade, per pupil expenditures for schools grew by only about 26% in real dollar terms.[13]

Meanwhile, schools have changed slowly. Most are still organized to prepare only about 20% of their students for "thinking work"—those students who are tracked very early into gifted and talented, "advanced," or honors courses. And most teachers have had little opportunity to learn to teach in the way new aca-

demic standards and a much more diverse student body demand. As the National Commission described in its report, a large proportion of teachers do not have adequate background in the fields they are asked to teach or sufficient skills for the students they need to reach.

More recent data suggest that the picture has improved little in the first half of this decade. In 1994, 21 percent of all public secondary teachers had less than a minor in their main assignment field, and 59% had less than a minor in their secondary teaching field.[14] More than 20% of public school teachers hired that year—and 27% of new entrants to teaching—had not met the requirements to enter teaching and were practicing with a substandard license in their main field or none at all.[15] And, even among those with preparation to teach, relatively few are well-prepared for the students they meet in today's classrooms, especially if they completed their training many years ago.

The American classroom requires teachers with high levels of knowledge and a broad range of skills. In 1996, for example, about 11 percent of U.S. students were identified as disabled,[16] and the vast majority of them (73 percent) were served in regular classrooms.[17] However, few teachers have had any opportunity to learn how to teach students with disabilities. At the same time, about 5 percent of American students were identified as limited English proficient,[18] yet just one-fourth of the teachers serving these children had received any training in strategies for teaching new English language learners.[19] In addition to these specific needs, more than one-third of students in the average classroom will be members of racial/ethnic minority groups or recent immigrants from a wide variety of cultures; more than one-fourth will live in households below the poverty line; and more than half will live in families that have experienced divorce, absence, or death of at least one parent.

Thus, in a typical classroom of 25 students, today's teacher will serve at least 4 or 5 students with specific educational needs that she has not been prepared to meet. In addition, she will need considerable knowledge to develop curriculum and teaching strategies that address the wide range of learning approaches, experiences, and prior levels of knowledge the other students bring with them as well. And she will need to know how to help these students acquire much more complex skills and types of knowledge than ever before.

Why Teaching Matters

For many decades, the United States education system has tried to improve student achievement by tinkering with various levers in the great machinery of schooling: New course requirements, curriculum packages, testing policies, management schemes, centralization initiatives, decentralization initiatives, and a wide array of regulations and special programs have been tried, all with the same effect. Reforms, we have learned over and over again, are rendered effective or ineffective by the knowledge, skills, and commitments of those in schools. Without know-how and buy-in, innovations do not succeed. Neither can they succeed without appropriate supports, including such resources as high-quality curriculum guidance and materials, time, and opportunities to learn.

Over the last decade, reforms have sought to increase the amount of academic coursework and the numbers of tests students take, in hopes of improving achievement. These initiatives have made a great difference in coursetaking: In 1983, only 14% of high school students took the number of academic courses recommended in *A Nation at Risk*—4 units in English and 3 each in mathematics, science, and social studies. By 1994, more than half (51%) had taken this set of recommended courses.

Despite these changes, achievement scores have improved little, and have actually declined slightly for high school students in reading and writing since 1988 (see figure 3). Meanwhile, the proportion of higher education institutions

offering remedial courses has increased, reaching 78% in 1995.[20] While the courses were taught, the overall quality of learning seems not to have improved. Clearly, the quality of teaching students receive must be as much a focus of attention as the number of courses they take.

Teacher expertise—what teachers know and can do—affects all the core tasks of teaching. What teachers understand about content and students shapes how judiciously they select from texts and other materials and how effectively they present material in class. Their skill in assessing their students' progress also depends on how deeply they understand learning, and how well they can interpret students' discussions and written work. No other intervention can make the difference that a knowledgeable, skillful teacher can make in the learning process. At the same time, nothing can fully compensate for weak teaching that, despite good intentions, can result from a teacher's lack of opportunity to acquire the knowledge and skill needed to help students master the curriculum.

How Teaching Matters

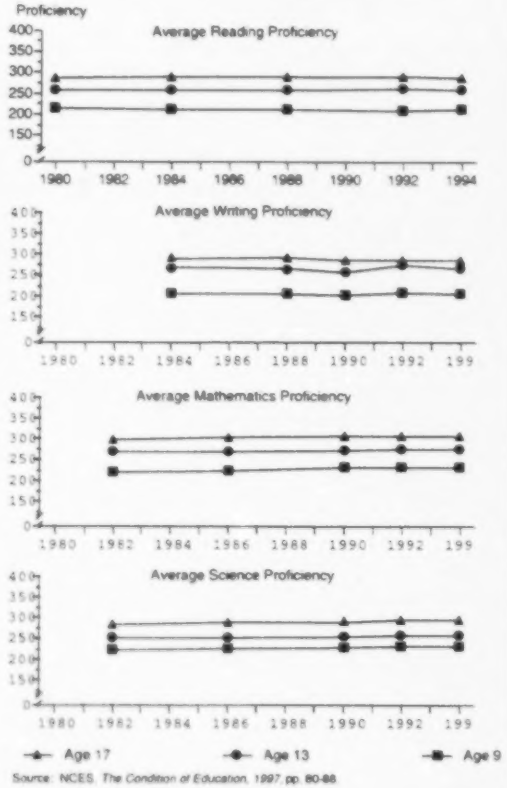
Studies discover again and again that teacher expertise is one of the most important factors in determining student achievement, followed by the smaller but generally positive influences of small schools and small class sizes. That is, teachers who know a lot about teaching and learning and who work in environments that allow them to know students well are the critical elements of successful learning.

In an analysis of 900 Texas school districts, Ronald Ferguson found that teachers' expertise—as measured by scores on a licensing examination, master's degrees, and experience—accounted for about 40% of the measured variance in students' reading and mathematics achievement at grades 1 through 11, more than any other single factor. He also found that every additional dollar spent on more highly qualified teachers netted greater increases in student achievement than did less instructionally focused uses of school resources[21] (see figure 4).

Figure 3

TRENDS IN STUDENT ACHIEVEMENT

(National Assessment of Educational Progress, scale scores)



Source: NCES, *The Condition of Education, 1997*, pp. 80-88.

The effects were so strong, and the variations in teacher expertise so great that, after controlling for socioeconomic status, the large disparities in achievement between black and white students were almost entirely accounted for by differences in the qualifications of their teachers. An additional contribution to student achievement was made by lower pupil-teacher ratios in the elementary grades. In combination, differences in teacher expertise and class sizes accounted for as much of the measured variance in achievement as did student and family background factors.

Ferguson and Helen Ladd repeated this analysis with a less extensive data set in

Alabama that included much rougher proxies for teacher knowledge (master's degrees and ACT scores instead of teacher licensing examination scores),[22] and still found sizable influences of teacher qualifications and smaller class sizes on student achievement gains in mathematics and reading. These influences held up when the data were analyzed at both the district and school levels. In an analysis illustrating the contributions of these variables to the predicted differences between districts scoring in the top and bottom quartiles in mathematics, they found that 31% of the predicted difference was explained by teacher qualifications and class sizes, while 29.5% was explained by poverty, race, and parent education.

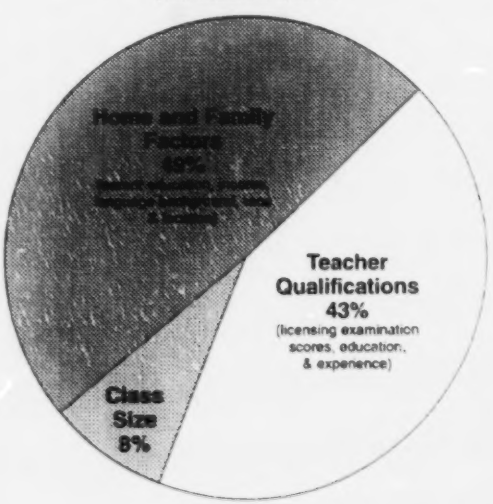
These findings are reinforced by those of a recent review of 60 production function studies[23] which found that teacher education, ability, and experience, along with small schools and lower teacher-pupil ratios, are associated with significant increases in student achievement. In this study's estimate of the achievement gains associated with expenditure increments, spending on teacher education swamped other variables as the most productive investment for schools (see figure 5).

The Commission reviewed many other studies that came to similar conclusions. For example, a study of high- and low-achieving schools with similar student populations in New York City found that differences in teacher qualifications accounted for more than 90% of the variation in student achievement in reading and mathematics at all grade levels tested.[24] Research using national data and studies in Georgia, Michigan, and Virginia have found that students achieve at higher levels and are less likely to drop out when they are taught by teachers with certification in their teaching field, by those with master's degrees, and by teachers enrolled in graduate studies.[25]

A Tennessee study of the effects of teachers on student learning found that elementary school students who are assigned to ineffective teachers for three years in a row score signifi-

Figure 4
Influence of Teacher Qualifications on Student Achievement

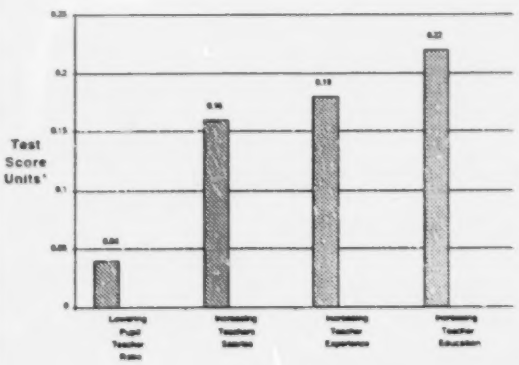
Proportion of Explained Variance in Math Test Score Gains (from Grades 3 to 5) Due To:


Home and Family Factors 49%
Teacher Qualifications 43%
(licensing examination scores, education, & experience)
Class Size 8%

Developed from data presented in Ronald F. Ferguson, "Paying for Public Education: New Evidence of How and Why Money Matters," *Harvard Journal on Legislation*, 28 (Summer 1991): 465-98.

Figure 5
Effects of Educational Investments

Size of Increase in Student Achievement fo Every $500 Spent on:



*Achievement gains were calculated as standard deviation units on a range of achievement tests in the 60 studies reviews.

Source: Rob Greenwald, Larry V. Hedges, & Richard D. Laine (1996). The Effect of School Resources on Student Achievement. *Review of Educational Research* 66(3), pp. 361-396.

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17

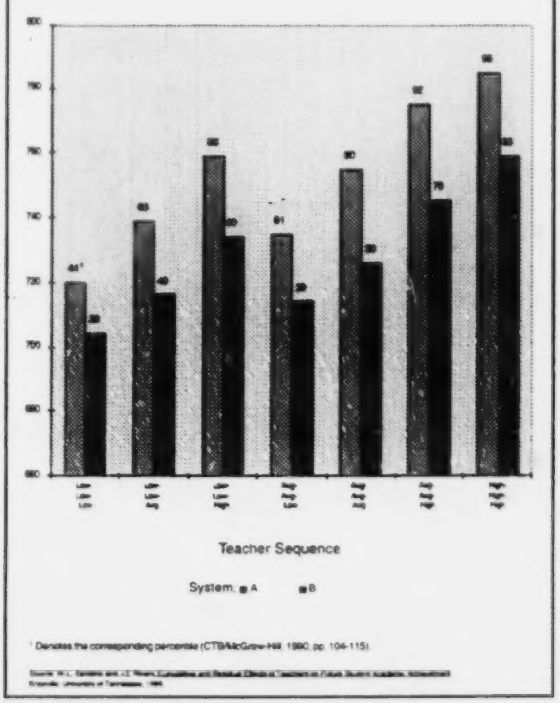
cantly lower on achievement tests than those assigned to the most effective teachers over the same period of time[26] (see figure 6). This study also found troubling indicators for educational equity: African American students were almost twice as likely to be assigned to the most ineffective teachers and about half as likely to be assigned to the most effective teachers. Clearly, teachers' knowledge and skills make a difference for both educational quality and equality.

What matters for teacher effectiveness? Research confirms that teacher knowledge of subject matter, student learning and development, and teaching methods are all important elements of teacher effectiveness. Reviews of more than two hundred studies contradict the long-standing myths that "anyone can teach" and that "teachers are born and not made." This research also makes it clear that teachers need to know much more than the subject matter they teach. Teacher education, as it turns out, matters a great deal. In fields ranging from mathematics and science to early childhood, elementary, vocational, and gifted education, teachers who are fully prepared and certified in both their discipline and in education are more highly rated and are more successful with students than are teachers without preparation, and those with greater training in learning, child development, teaching methods, and curriculum are found to be more effective than those with less.[27]

Figure 6

Cumulative Effects of Teacher Effectiveness

Student test scores (5th grade math) by effectiveness level of teachers over a three-year period, for two metropolitan school systems



Not only does teacher education matter, but more teacher education appears to be better than less—particularly when it includes carefully planned clinical experiences that are interwoven with coursework on learning and teaching. Recent studies of redesigned teacher education programs—those that offer a five-year program including an extended internship—find their graduates are more successful and more likely to enter and remain in teaching than graduates of traditional undergraduate programs.[27]

The kind and quality of inservice education also makes a difference. A recent large-scale study by David Cohen and Heather Hill[29] found that mathematics teachers who participated in sustained professional development based on the curriculum they were learning to teach were much more likely than those who engaged in other kinds of professional development to report reform-oriented teaching practices. These practices and this professional development participation were, in turn, associated with higher mathematics achievement for students on the state assessment, after taking student characteristics and school conditions into account. The professional development which proved effective involved teachers in working directly with one another and with experts on new student curriculum materials related to specific concepts in California's mathematics framework. Teachers collaboratively studied these materials, developed and tried lessons, and discussed the results with their colleagues, raising issues of mathematics

content, instruction, and learning together.

Other studies have found similar results for intensive curriculum-based professional development. A study of student achievement on the 1993 California Learning Assessment System (CLAS) found performance higher at all grade levels when teachers had extended opportunities to learn about mathematics curriculum and instruction.[30] A study of mathematics reforms in Pittsburgh's QUASAR schools found that students achieved at higher levels where their teachers had greater opportunities to study a coherent curriculum that focused on enhancing teachers' understanding of mathematics teaching strategies *and* on their implementation of new approaches with systematic reflection on the outcomes of instruction.[31]

The National Assessment of Educational Progress has documented that the qualifications and training of students' teachers are also among the correlates of reading achievement: Students of teachers who are fully certified, who have master's degrees, and who have had professional coursework in literature-based instruction, whole language approaches, study strategies, and motivational strategies do better on reading assessments (see table 1). Furthermore, teachers who have had more professional coursework are more likely to use the literature-based and writing-based approaches to teaching reading and writing that are associated with stronger achievement. For example, teachers with more staff development hours in reading are much more likely to use a wide variety of books, newspapers, and materials from other subject areas and to engage students in regular writing, all of which are associated with higher reading achievement; they are less likely to use reading kits, basal readers, and workbooks which are associated with lower levels of reading achievement.[32]

These studies and others are gradually helping to build a foundation for professional development investments associated with productive teaching practices that can support student achievement on a wide scale.

Lessons from Last Decade's Reforms

The critical importance of investments in teaching is demonstrated by states' experiences over the past ten years. Over that decade of reform, a few states undertook major initiatives aimed at improving the quality of teaching.

Notable among them for the size and scope of investments were North Carolina and Connecticut. Both of these states coupled major statewide increases in teacher salaries with intensive recruitment efforts and initiatives to improve preservice teacher education, licensing, beginning teacher mentoring, and ongoing professional development. Since then, North Carolina has posted among the largest student achievement gains in mathematics and reading of any state in the nation, now scoring well above the national average in 4th grade reading and mathematics, although it entered the 1990s near the bottom of the state rankings. (See figures 7-9). Connecticut has also posted significant gains, becoming one of the top scoring states in the nation in mathematics and reading, despite an increase in the proportion of students with special needs during that time.[33]

North Carolina's reforms boosted minimum salaries, launched an aggressive fellowship program to recruit able students into teacher preparation by subsidizing their college education, required schools of education to become professionally accredited, invested in improvements in teacher education curriculum, created professional development academies and a North Carolina Center for the Advancement of Teaching, developed local sites to support networks like the National Writing Project, launched a beginning teacher mentoring program, and introduced the most wide-ranging set of incentives in the nation for teachers to pursue National Board Certification. North Carolina now boasts more Board-Certified

Table 1

Correlates of Reading Achievement

(Average Student Proficiency Scores, National Assessment of Education Progress, 1992)

Correlates of Reading Achievement	Lower Scores	Higher Scores
TEACHER QUALIFICATIONS		
Level of Certification	Substandard or none 214	Highest level 219
Levels of Education	Bachelor's Degree 215	Master's degree 220
Coursework in literature-based instruction	No coursework 214	Yes coursework 218
Coursework in whole language approaches	No coursework 214	Yes coursework 218
TEACHING PRACTICES		
Types of materials used	Primarily basal readers 214	Primarily trade books 224
Instructional Approaches	Structured Subskills 200	Integrative language 220
Emphasis on Integrative Reading and Writing	Little/no emphasis 211	Heavy emphasis 220
Emphasis on Literature-based reading	Little/no emphasis 208	Heavy emphasis 220
Frequency of use of reading workbooks and worksheets	Almost every day 214	Less than weekly 222
Frequency with which students write about what they have read	Less than weekly 214	Almost every day 221
Frequency with which teachers use reading kits to teach reading	At least once a week 211	Never or rarely 219
Frequency with which teachers take class to library	Never or rarely 209	At least once a week 219
Use of multiple choice tests to assess students in reading	At least once a week 209	Less than monthly 222
Use of short-answer tests to assess students in reading	At least once a week 214	Less than monthly 222
Using of written assignments to assess students in reading	Less than monthly 210	At least once a week 220

Source: 1992 NAEP Trial State Assessment

teachers than any other state. Recently, the state has created a professional standards board for teaching and has passed legislation that will create professional development school partnerships associated with all schools of education, develop a more intensive beginning teacher mentoring program, further upgrade licensing standards, create pay incentives for

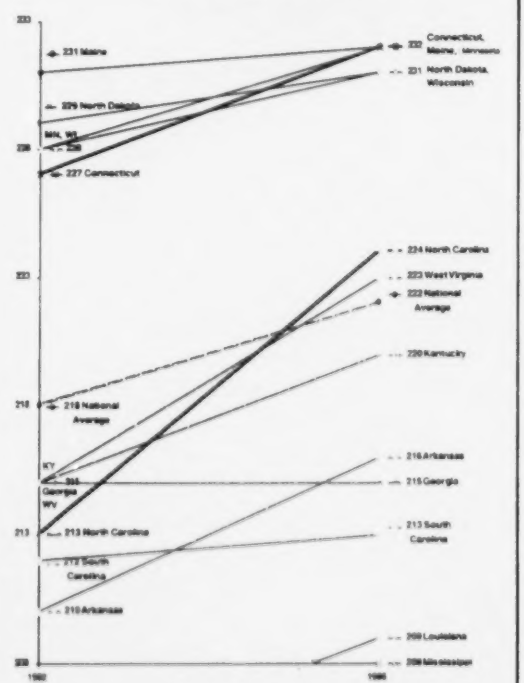
teachers who pursue master's degrees and Board Certification, and raise teacher salaries to the national average.

Connecticut spent over $300 million in 1986 to boost minimum beginning teacher salaries in an equalizing fashion that made it possible for low-wealth districts to compete in the market for qualified teachers. This initiative eliminated teacher shortages in the state, even in the cities, and created surpluses of teachers. At the same time, the state raised licensing standards, instituted performance-based examinations for licensing and a state-funded beginning teacher mentoring program, required teachers to earn a master's degree in education for a continuing license, invested in training for mentors, and supported new professional development strategies in universities and school districts. Recently, the state has further extended its performance-based licensing system to incorporate the new INTASC standards and to develop portfolio assessments modeled on those of the National Board for Professional Teaching Standards. Connecticut is also supporting the creation of professional development schools linked to local universities.

During the 1990s, substantial gains were also realized by states like West Virginia and Arkansas, which raised teachers' salaries and licensing standards and required accreditation of teacher education schools, and Kentucky, which funded extensive professional development in support of its curriculum and assessment reforms.

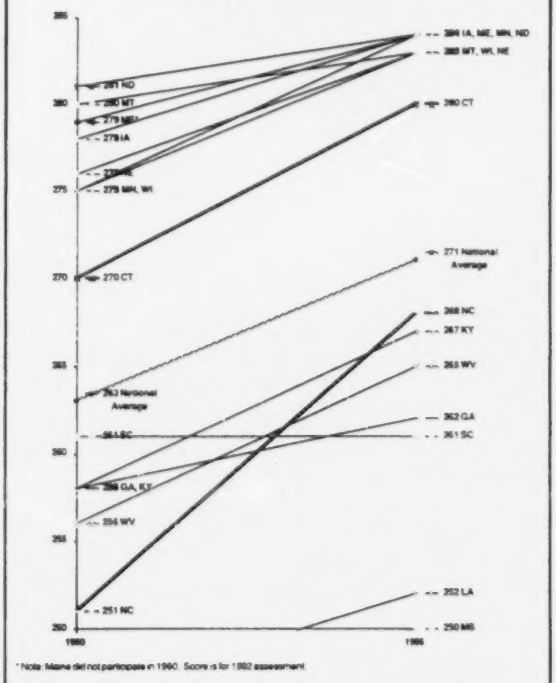
Meanwhile, there are a number of states that repeatedly lead the nation in achievement, each of which has made longstanding investments in the quality of teaching. The three long-time leaders—Minnesota, North Dakota, and Iowa—have all had a long history of professional teacher policy and are among the 12 states that have state professional standards boards which enacted high standards for enter-

Figure 7
State Trends in Mathematics Achievement, Grade 4
(NAEP scores, 1992-1996)



Source: U.S. Department, National Center for Education Statistics.
NAEP 1996 Mathematics Report Card for the Nation and the States, Table 2.2, p. 28.

Figure 8
State Trends in Mathematics Achievement, Grade 8
(NAEP scores, 1990-1996)



* Note: Maine did not participate in 1990. Score is for 1992 assessment.

Source: U.S. Department, National Center for Education Statistics.
NAEP 1996 Mathematics Report Card for the Nation and the States, Table 2.3, p. 30.

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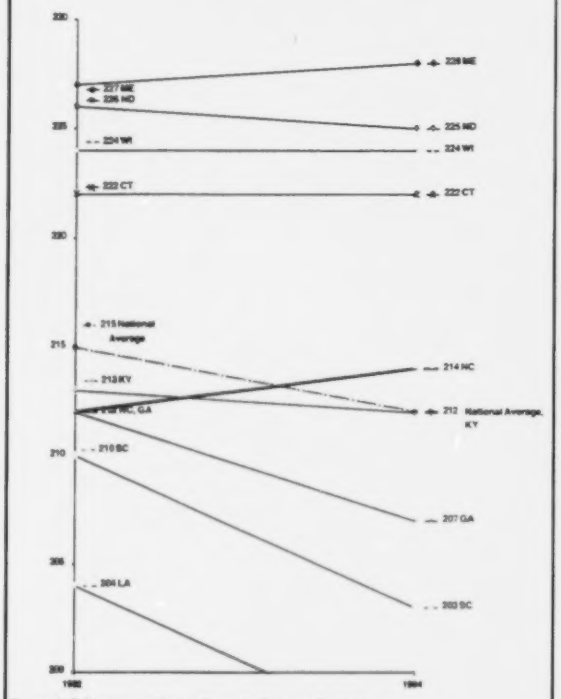
Figure 9
State Trends in Reading Achievement, Grade 4
(NAEP scores, 1992-1994)



Source: U.S. Department, National Center for Education Statistics.
NAEP 1994 Reading Report Card for the Nation and the States, Table 2.3, p. 25.

boards which enacted high standards for entering teaching. Other high-scoring states like Wisconsin, Maine, and Montana have also enacted rigorous standards for teaching and are among the few that rarely hire unqualified teachers on substandard licenses (see Appendix B). Iowa, Minnesota, Montana, North Dakota, and Wisconsin have among the lowest rates of out-of-field teaching in the country and among the highest proportions of secondary teachers holding both certification and a major in the field they teach.[34] Maine joined these states in requiring certification plus a disciplinary major when it revised its licensing standards in 1988.

These states have also been leaders in redefining teacher education and licensing. Minnesota was the first state to develop performance-based standards for licensing teachers and approving schools of education during the mid-1980s, and has developed a beginning teacher residency program in the years since.[35] Wisconsin was one of the first states to require high school teachers to earn a major in their subject area in addition to extensive preparation for teaching. Thus, teacher education in Wisconsin is typically a 4½ to 5 year process. (The Wisconsin approach contrasts with that of states that reduced preparation for teaching when they required students to gain a disciplinary major at the bachelor's degree level.) Maine, Wisconsin, Iowa, and Minnesota have all incorporated the INTASC standards into their licensing standards and have encouraged universities to pilot performance-based assessments of teaching using these standards.

By contrast, state reform strategies during the 1980s that did not include substantial efforts to improve teaching have been much less successful. States that instituted new tests in the 1980s without investing in teaching did not experience improved achievement. For example, the first two states to organize their reforms around a student testing strategy were Georgia, with its Quality Basic Education Act of 1985, and South Carolina, with its Education Improvement Act of 1984. These states developed extensive testing systems attached to high stakes consequences for students, teachers, and schools. Although both states also mandated tests for teachers, they did not link these assessments to emerging knowledge about teaching or to new learning standards, nor did they invest in improving schools of education or ongoing professional development. As figures 7-9 show, student achievement in mathematics has been flat in these states while achievement in reading declined since 1990. Changes in tests and curriculum were not enough to overcome the effects of low standards for teacher education and licensing and the hiring of large numbers of uncertified teachers.[36] As described later, both states have recently undertaken major reforms of teaching that may make an important difference in the future.

The Current Status of Teaching: Where are We Now?

The Commission's recommendations constitute a long-term agenda for American education. Later in this report we describe how many of them have been pursued in a number of states and districts. Here we discuss recent trends that characterize the current status of teaching, and suggest the kinds of continuing efforts that are needed to support improvements in the supply of teachers and the quality of teaching.

Will We Have Enough Teachers?

The nation has never before hired as many teachers in a decade as it will between now and the year 2007. The demand for teachers will continue to grow sharply as student enrollments reach their highest level ever, and teacher retirements and attrition create large numbers of vacancies. By 2007, student enrollments will grow to 54.3 million, up from about 50 million in 1995,[37] stoked by the baby "boomlet" and growing immigration rates. The size of the teaching force is projected to exceed 3.3 million by 2007, up from 2.5 million in 1982 (see figure 10).

Meanwhile, a large number of teachers are nearing retirement age. In 1994, teachers' average age was 43, up from about 40 in 1988. Fully one-fourth of all public school teachers are 50 years old or older, a sign that retirements can be expected to increase.[38] Even greater rates of retirement can be anticipated in fields like bilingual education and vocational education and in states like California, Michigan, and New Jersey which have the largest proportions of older teachers.

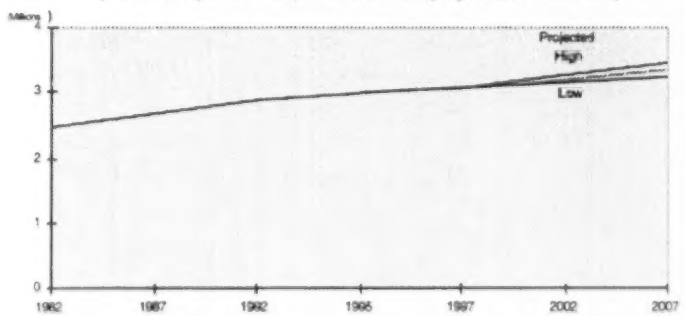
Recruitment needs to focus not only on ensuring that we have enough teachers, but also on recruiting a diverse teaching force that represents the American population if majority and minority students are to experience diverse role models. The proportion of minority teachers (about 13%) continues to be far less than the proportion of minority students (just over 33% in public schools) and far less than most school districts would like to hire. The sharp decrease in the number of college students of color choosing teaching during the 1970s and '80s, when other occupations with higher salaries became open to minorities, has been reversed in recent years, but not nearly enough to meet demand. In 1994, teachers of color comprised 15% of beginners with 1 to 3 years of experience. However, improvements in the recruitment of Native American, Asian, and Hispanic teachers were offset by continuing declines in the numbers of African American teachers entering teaching (see table 2).

Using the most conservative estimates, the nation will need to hire at least 2 million teach-

Figure 10

Demand for Elementary and Secondary Teachers

(Public and private K-12, with alternative projections: 1983-2007)



Source: National Center for Education Statistics, *Projections of Education Statistics to 2007*, p. 68.

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ers over the next ten years.[39] While all states and regions will experience these increases, much of the demand for teachers will occur in the South and the West, and in port cities on both coasts.

Although this level of demand is daunting, the country has for many years graduated more new teachers than it hires. In recent years, only one-third to one-half of all newly hired teachers have been new to teaching, since many districts prefer to hire experienced teachers and fill vacancies with teachers transferring from other schools or returning to the profession. Usually only about three-quarters of prospective beginners who apply for jobs get offers of employment, and only two-thirds of newly prepared teachers take full-time teaching jobs in the year after they graduate.[40] In 1993, there were over 140,000 bachelor's degree recipients who graduated with preparation for teaching (not all of whom applied to teach), and about 20,000 who prepared to teach in master's degree programs.[41] This was more than enough for the number of vacancies to be filled by beginning teachers.

Although there are many new teachers who cannot find jobs, there are also many job openings for which schools have difficulty finding teachers. For example, in 1994, more than 50% of schools with vacancies in special education, bilingual education or English as a second language, physical science, life science, or foreign languages—and more than 40% of schools with vacancies in mathematics—had difficulty filling the positions (see figure 11). In almost every field, schools with the largest numbers of low-income and minority students were much more likely than other schools to report that they had difficulty filling vacancies.[42] These schools were also much more likely than others to fill vacancies with unqualified teachers, substitutes, or teachers from other fields, or to expand class sizes or cancel course offerings when they could not find teachers (see figure 12).

These "shortages," though, are largely a problem of distribution rather than of absolute numbers. Wealthy districts that pay high salaries and offer pleasant working conditions rarely experience shortages in any field. Districts that serve low-income students tend to pay teachers less and offer larger class sizes and pupil loads, fewer materials, and less desirable teaching conditions, including less professional autonomy. For obvious reasons, they have more difficulty recruiting teachers. States that produce large numbers of teachers or have slow enrollment growth have surpluses of teachers, while those that have fewer teacher

Table 2

Teacher Characteristics

(Percentage distribution of teachers according to race-ethnicity, by years of teaching experience)

	American Indian/ Alaskan Native	Asian/ Pacific Islander	Black, non-Hispanic	Hispanic	White, non-Hispanic
Total	0.7	1.1	6.7	4.1	87.3
Teaching experience					
3 or fewer years	0.9	1.6	6.0	6.8	84.7
4-9 years	0.8	1.3	5.8	5.1	86.9
10-19 years	0.7	0.9	6.4	4.0	88.1
20 or more years	0.7	1.0	8.0	2.5	87.8

Note: Percentage distributions may not sum to 100 due to rounding.

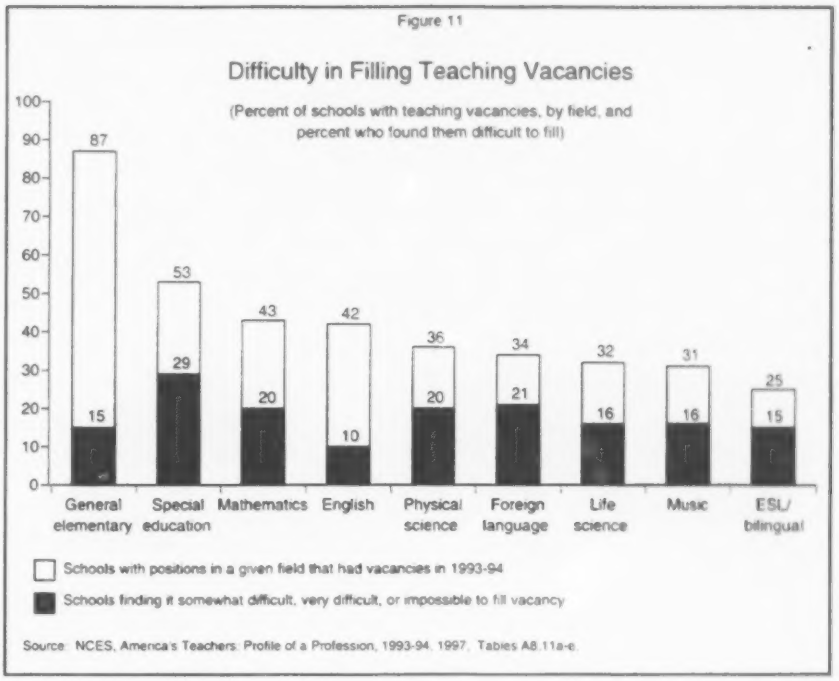
Source: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 1993-94 (Teacher Questionnaire) America's Teachers, p. 10.

preparation programs or rapid enrollment growth must import teachers from elsewhere.

There are three major problems to be addressed. One is that few states have equalized school funding or teachers' salaries so that all districts can compete equally in the market for well-prepared teachers. States that have taken steps to raise and equalize salary levels—such as Connecticut and Kentucky—have greatly reduced shortages in central cities and rural communities.[43]

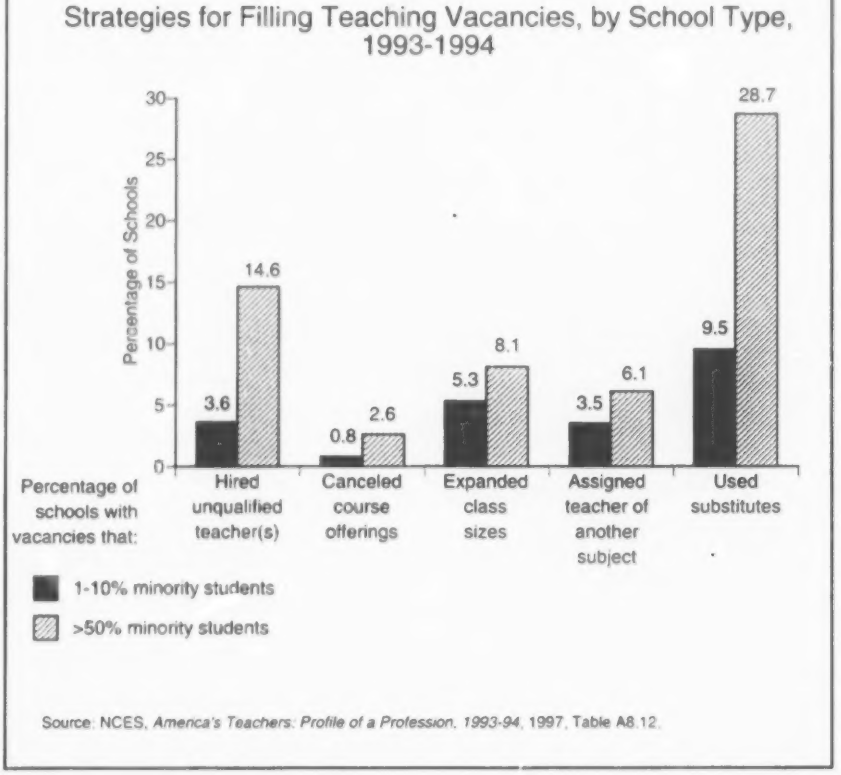
A second problem is that most states still have licensing policies which assume that labor markets for teachers are local. State standards vary widely; there is little reciprocity among states; and most states still license teachers based on their graduation from state-approved programs rather than more comparable, national standards. In many cases, neither licenses nor seniority and pensions are portable. As a consequence, teachers cannot easily get from the states that have large surpluses to those that

Figure 11



Source: NCES, America's Teachers: Profile of a Profession, 1993-94, 1997, Tables A8.11a-e.

Figure 12



Source: NCES, *America's Teachers: Profile of a Profession, 1993-94*, 1997, Table A8.12.

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have large shortages. In the last two years, more than 20 states have taken steps that should eventually improve reciprocity by adopting common standards through the Interstate New Teacher Assessment and Support Consortium (INTASC) and beginning to develop examinations linked to these standards. At least 13 states have also adopted policies that will make it possible for teachers who have achieved National Board certification to become licensed without additional requirements if they move into a state.[44]

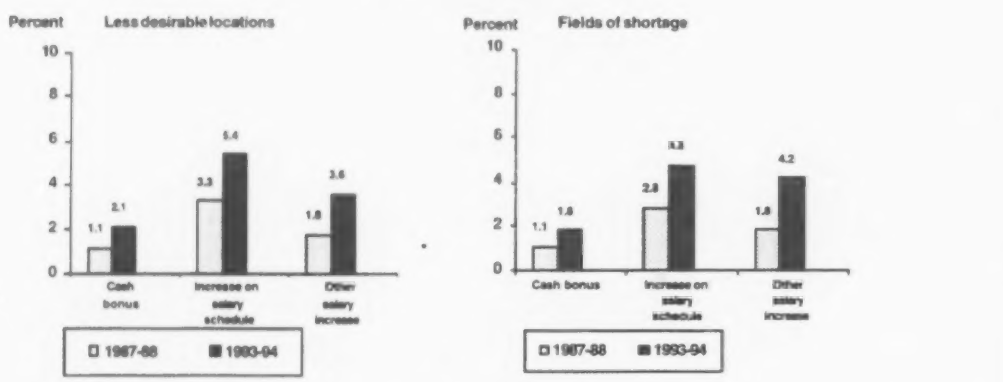
A third problem is that some large districts have had hiring procedures that are so cumbersome, dysfunctional, and untimely that they chase the best-prepared candidates away instead of aggressively recruiting them. These procedures can be changed. In *What Matters Most*, we highlighted a successful initiative in Fairfax County, Virginia to streamline and overhaul what had been a 62-step hiring process that took months to complete into a computerized, carefully managed two-week process. Other large districts have also taken steps to become proactive in recruiting well-prepared candidates. A commitment to teaching quality is the first step. Over the past two years, New York City—once a hiring source for thousands of unlicensed teachers annually—has worked to ensure qualified teachers for all of its students by streamlining hiring procedures and aggressively recruiting well-prepared teachers through partnerships with local universities. In 1997, New York filled two-thirds of its 5500 vacancies with fully qualified teachers, in contrast with only one-third of a smaller number in 1992. It meanwhile reduced the total number of uncertified teachers in the city by more than half. (See below.)

More districts have experimented in recent years with bonuses or salary increments to attract recruits for shortage fields or hard-to-staff schools, although the number trying any of these strategies still represents only about 10 percent of all school districts[45] (see figure 13). About 19 percent of private schools offer some kind of financial incentive to attract teachers in specific fields. Public schools are more likely to offer free retraining to help teachers prepare in shortage fields like special education, bilingual

Figure 13

Use of Financial Incentives to Address Shortages

(Percentage of public school districts that offered various financial incentives to recruit and retain teachers in less desirable locations or in fields of shortage, 1987-88 and 1993-94)



Source: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey: 1987-88 and 1993-94 (Teacher Demand and Shortage Questionnaires). Published in National Center for Education Statistics, *America's Teachers*, p. 101.

Recruiting the Best

Local school districts and teacher education programs are redoubling their efforts to solve the persistent problems of teacher recruitment and preparation. One remarkable example of progress can be seen in New York City, highlighted in last year's Commission report for its difficulties in recruiting qualified teachers. The Big Apple, which has struggled for years with cumbersome and dysfunctional hiring procedures that have led to the hiring of thousands of uncertified teachers annually, has made a commitment to placing a qualified teacher in every classroom. With a set of wide-ranging efforts by its personnel department, New York had come much closer to achieving its goal by the opening of school in 1997 when two-thirds of its 5500 vacancies were filled with fully qualified teachers, as compared to one-third of a smaller number in 1992.

Key to this success are a series of efforts that bring the city's recruiters directly to students in local preparation programs each spring; offer interviews and tests on-site at college campuses; recruit teachers in high-need areas like bilingual and special education through scholarships and forgivable loans as well as strategically located recruitment fairs; work with universities and local districts to bring well-trained prospective teachers into hard-to-staff schools as student teachers, interns, and visitors; make offers to well-qualified candidates much earlier in the year; and streamline the exchange of information and the processing of applications. More efforts are underway to create automated systems for projecting vacancies and processing information, decentralize interviews to principals and committees of teachers in local schools, and strengthen partnerships with local colleges. With expansion of these efforts, the city hopes to fill all of its vacancies with caring, competent, well-qualified teachers by the year 2000.

education or English as a Second Language, mathematics, science, and computer science. School districts offering this retraining are most often those serving large proportions of low-income students.[46]

Whether these efforts will prove sufficient to ensure that all students have access to a diverse, well-qualified teaching force depends on a number of other factors that will take shape over the coming years. These include attractions to teaching, such as salaries and working conditions, and supports that could improve the retention of beginning and mid-career teachers.

Salaries and Working Conditions

The Commission noted that teachers are less well-paid than similarly educated workers, and that the share of the education dollar spent on teachers' salaries dipped below 40% more than a decade ago, as schools became more bureaucratic and spent less of their funds on teaching. One recommendation urged much greater investment in teaching—in a greater number of better-prepared and better-paid teachers—by reallocating to classroom teaching positions some of the funds currently spent on add-on and pull-out programs as well as nonteaching positions that are intended to oversee or supplement the work of teachers. Few states have made much progress on this agenda (see Appendix A), but some individual schools and districts, along with organizations like the New American Schools Corporation, have taken steps to redesign schools so that they focus more of their resources on teaching.[47]

Competitive salaries for teachers have made a greater difference in supply and quality since

the 1970s, when the nation lost its once captive labor market for teaching, which had long been maintained by lack of employment opportunities for women and minorities. The opening up of other professional jobs to these groups, coupled with a steady drop in salaries and teacher demand, led to a large decrease in both the numbers of college students choosing teaching and in the academic ability of candidates. By 1983, entrants to teaching were among the least academically well-prepared college students. Furthermore, the most able among them defected from teaching sooner and in greater numbers.[48]

Teachers' salaries climbed during the 1980s, stimulating increases in the supply of teachers as well as the academic ability of new candidates, who now hold better academic records than the average college student.[49] However, salaries have leveled off again since 1990, remaining about 25 percent below those of similarly educated workers at the entry level and nearly 20 percent below average salaries of those with at least a bachelor's degree[50] (see figure 14). Taking into account their vacation time and income possibilities during the summer, teachers still earn 10 to 15 percent less than their similarly educated colleagues in other occupations. The differential is highest in fields that require strong backgrounds in mathematics and science, such as engineering and the health professions, where there is a 30 to 50 percent differential in beginning pay. However, there is also a growing gap between the beginning salaries of teachers and individuals who enter the social sciences.[51]

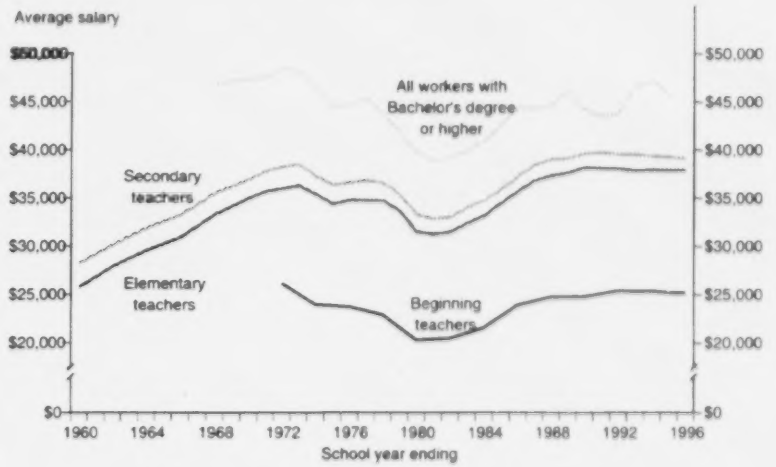
Meanwhile, teachers are working harder than ever before. In 1996, teachers' average work week of 49 hours, which included 11 hours of noncompensated time after school hours, was longer than it had ever been since trend data were first collected in 1961.[52] Average class sizes remain at about 24, with secondary school teachers carrying course loads of between 5 and 6 periods daily and pupil loads of 124 students at a time. Class sizes and pupil loads were highest in schools with the largest proportions of minority students.[53]

An ongoing problem in recruiting well-prepared teachers to poor school districts is the continued inequality in funding that plagues American schools. In 1994, the best-paid teachers in low-poverty schools earned over 35% more than those in high-poverty schools

Figure 14

Teachers' Salaries Compared to Those of Other Workers

(Average Annual Salaries (in 1996 constant dollars)



Source: NCES, *Digest of Education Statistics, 1966* and Schools and Staffing Survey, 1993-94 (Teacher Questionnaire). U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-60. American Federation of Teachers, *Survey and Analysis of Salary Trends 1996*, December 1996.

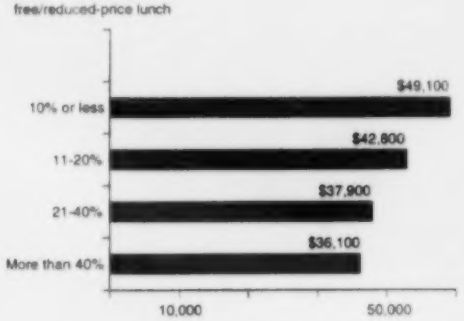
(see figure 15). Furthermore, teachers in more advantaged communities have much easier working conditions, including smaller class sizes and pupil loads, and much more control over decision making in their schools.[54] Teachers in high-poverty schools are much less likely to say they that they have influence over decisions concerning curriculum, texts, materials, or teaching policies. They are also much less likely to be satisfied with their salaries or to feel they have the necessary materials available to them to do their job.[55]

Teacher Retention

Working conditions, including influence over professional decisions, play an important role in determining who stays in teaching. Between 1988 and 1994, teacher attrition rates climbed from 5.6% to 6.6% of all teachers.[56] This was partly due to growing retirements and partly due to the continuing high rates of attrition for beginning teachers, more than 30 percent of whom leave within the first 5 years of teaching.[57] Of those who left, about 27% retired; 37% left for family or personal reasons; and 26% were dissatisfied with teaching or sought another career.[58] The major areas of dissatisfaction concerned student motivation and discipline, on the one hand, and lack of recognition and support from administration, on the other. Salaries were also a factor, but a somewhat less prominent one. Not surprisingly, attrition rates in 1994 were higher in high-poverty than low-poverty schools, and those who left high-poverty schools were more than twice as likely as those in low-poverty schools to leave because of dissatisfaction with teaching.[59]

Figure 15

Top public school teacher salaries
(By poverty status of students: 1993-94)



Source: National Center for Education Statistics, Schools and Staffing Survey 1993-94 (Public School and Teacher Demand and Shortage Questionnaires) *America's Teachers*, p. 71

Control over salient elements of the working environment is an important factor in teacher retention. Those who left teaching in 1994 were much more satisfied with all of the aspects of their new, nonteaching employment than were those who stayed in teaching. Ex-teachers were most noticeably more satisfied than current teachers with their influence over policy, professional prestige, resources available, support from administrators, and manageability of work. Those who had left also viewed their current salaries, general working conditions, and opportunities for advancement much more favorably than did those who stayed in teaching (see figure 16).

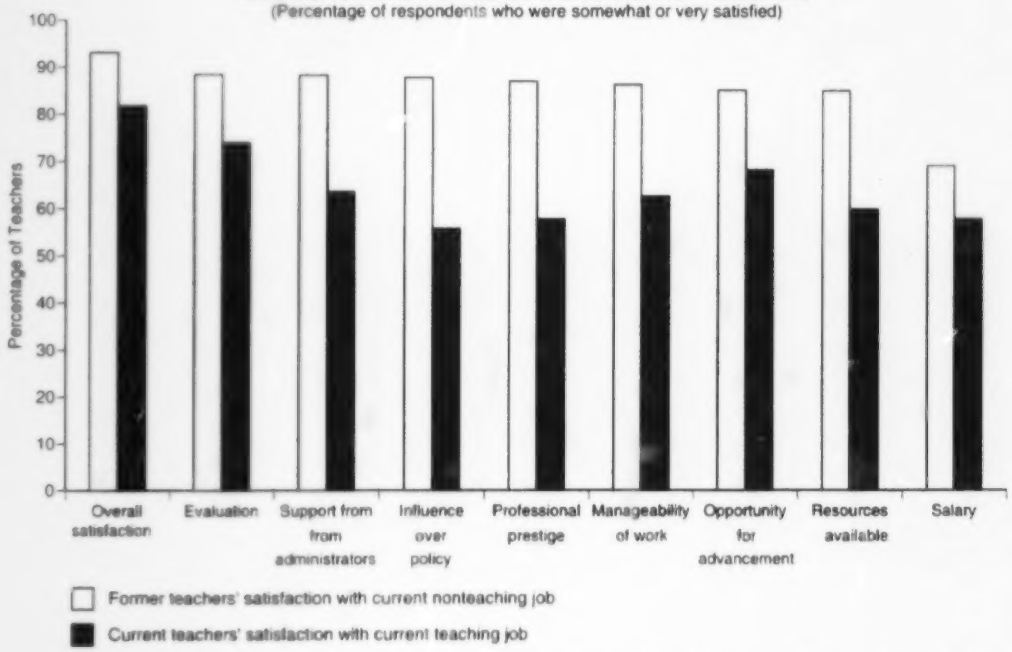
Recent reforms may be improving teachers' satisfaction with some aspects of their work. The proportions of teachers saying they were satisfied with the intellectual challenges of teaching and with their opportunities for advancement increased significantly between 1988 and 1995,[60] as did the proportions of teachers saying they would advise a young person to pursue a career in teaching (see figure 17). It is possible that teachers' growing involvement in curriculum and school reforms, along with greater opportunities for broader professional roles—for example, as mentor and consulting teachers and instructional leaders—have contributed to these changes.

Teachers also feel more positively than they did a decade ago about the quality of preparation their entering colleagues have received, and they feel better about their own salaries and recognition. Fewer report that they have

Figure 16

Job Satisfaction of Current and Former Teachers

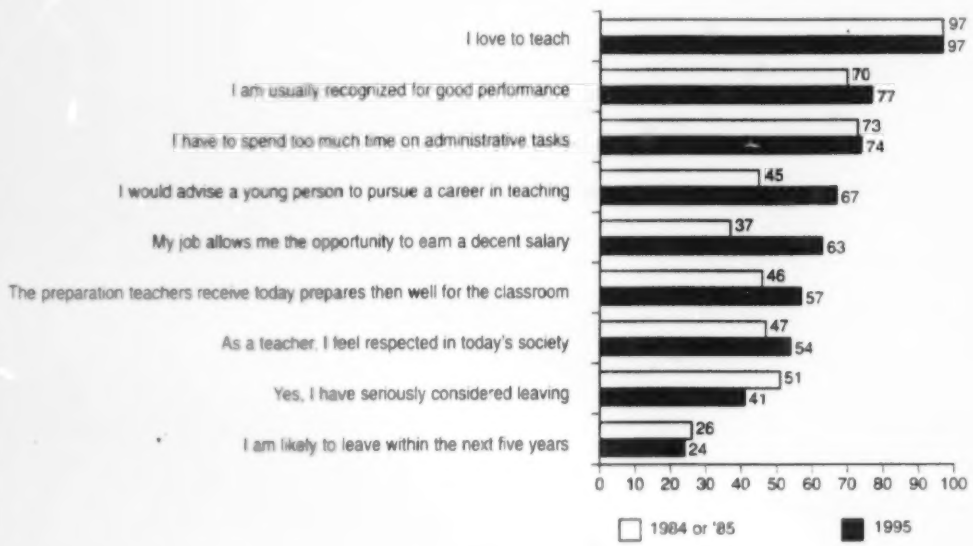
(Percentage of respondents who were somewhat or very satisfied)



Source: U.S. Department of Education, National Center for Education Statistics, Teacher Follow-up Survey: 1994-95. *America's Teachers*, pp. 90-91, Tables 7.5a and 7.5b.

Figure 17

Trends in Teachers' Views of Teaching



Source: National Center for Education Statistics. *Digest of Education Statistics, 1996*, Tables 73 and 75.

seriously considered leaving teaching. Confirming these trends is the fact that the proportion of teachers who report they would certainly become teachers again if they had the chance increased from 33 to 40% between 1988 and 1994.[61] This is part of a continuing upward trend since 1981, when the attractiveness of teaching hit its lowest point. Women, elementary teachers, and teachers in small school systems feel most positively about their career choice.[62] It is noteworthy, though, that most teachers are not entirely sure that they would make the same career choice if they had it to do over again.

Teachers' plans to remain in teaching are highly sensitive to their perceptions of their working conditions. About 33 percent of public school teachers and 49 percent of private school teachers plan to remain in teaching as long as they are able. These proportions, though, vary widely depending on how teachers feel about administrative support, faculty cooperation, resource provision, and teacher influence over policy in their schools (see figure 18).

In general, teachers feel they have much more control over classroom decisions—such as selecting teaching techniques or determining homework and grades—than they do over school policy decisions, such as curriculum and disciplinary policies, the content of inservice programs, or the hiring and evaluation of teachers. Teachers in public schools feel they have far less influence over important decisions than do teachers in private schools (see figure 19). Teachers in central city and high-minority schools feel they have the least decision making authority. This compounds the other disincentives for teaching in these schools—disincentives that include lower salaries and larger class sizes—which feed, in turn, into the disparities in teacher qualifications and teaching quality that students in different schools experience.[63]

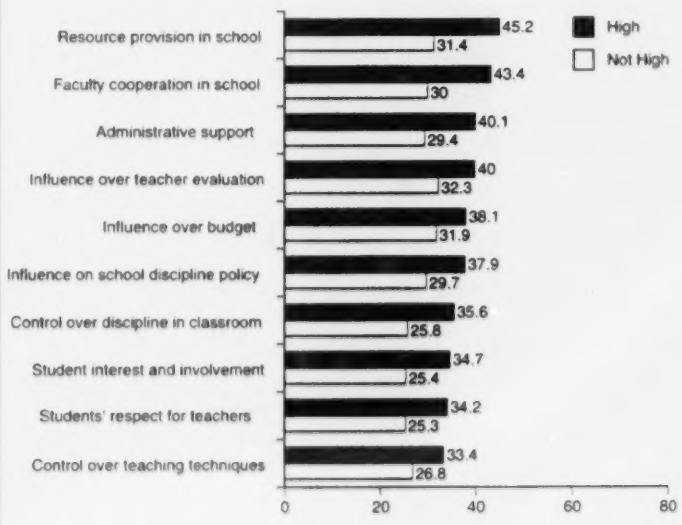
Qualifications and Training

The story regarding teachers' qualifications is one of tremendous unevenness. The good news is that many new teachers are better prepared for teaching than ever before. Recent data indicate that more new teachers are being prepared in redesigned teacher education programs that allow them to get a degree in their field while completing their training in education at the graduate level. In 1994, about 20%

Figure 18

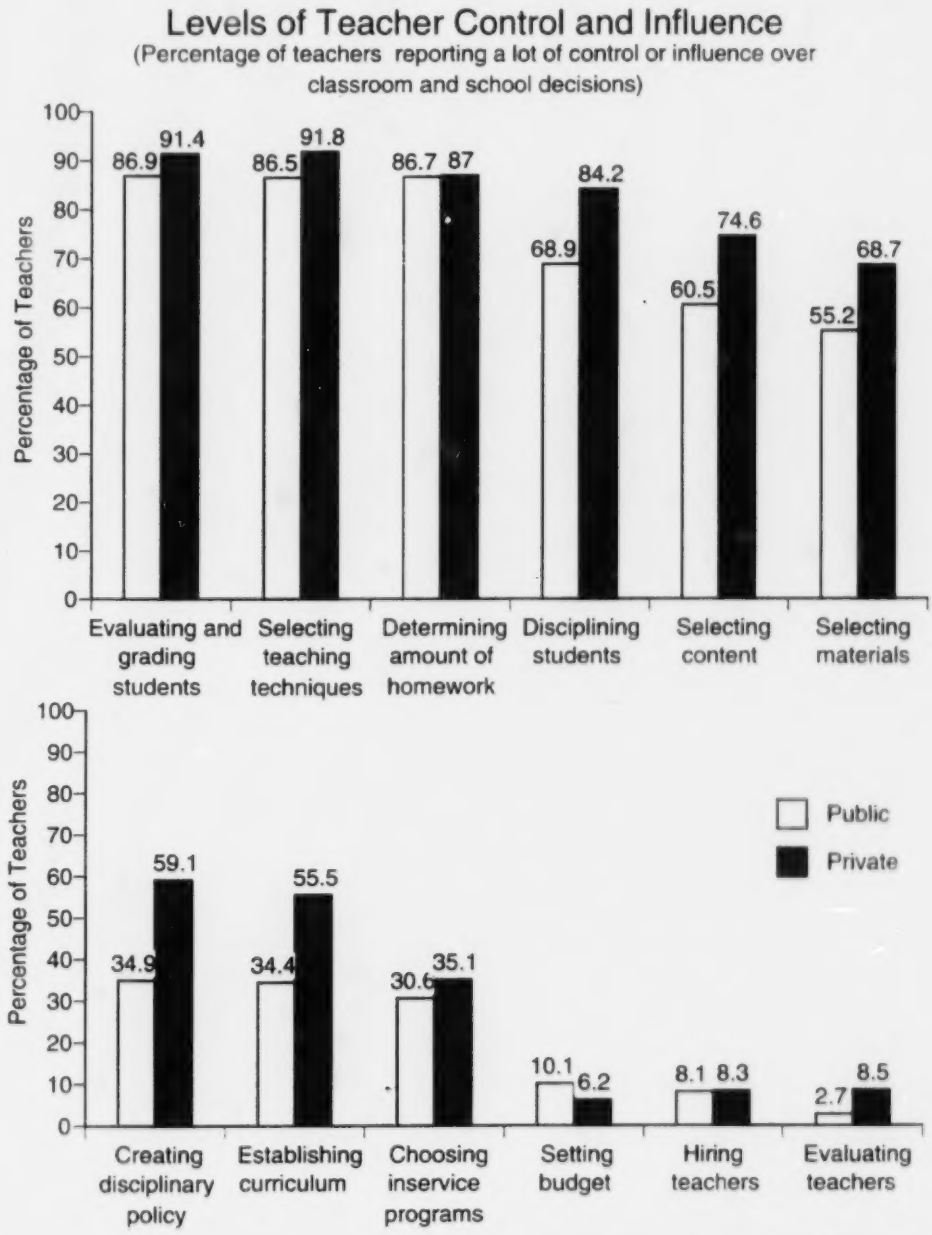
Teachers' Views of Teaching and Plans to Stay

Percentage of teachers who plan to remain in teaching as long as they are able by perceptions of their work environments: 1993-94



Source: National Center for Education Statistics, Schools and Staffing Survey: 1993-94 (Public School Teacher Questionnaire). *America's Teachers*, p. 93.

Figure 19



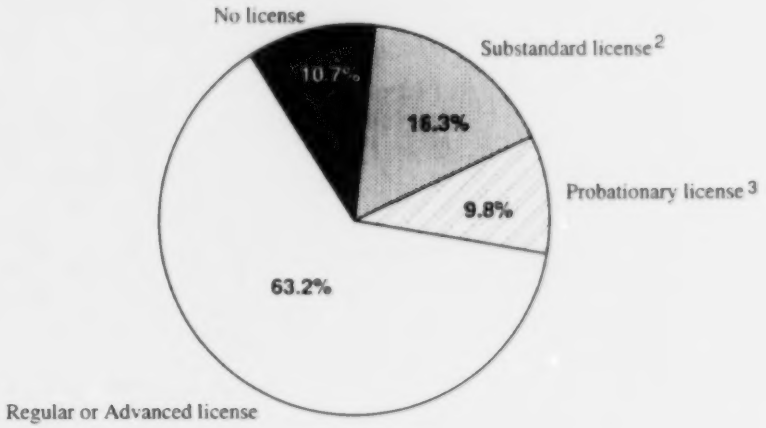
of all new entrants to teaching were hired with a master's degree as compared to 9% in 1991.[64] In addition, as we noted above, more able individuals are being attracted to teacher training programs than was the case in the 1980s.

The bad news is that the number of newly hired teachers entering the field without adequate training has not declined. In 1991, 25% of new entrants to public school teaching had not completed the requirements for a license in their main assignment field. This proportion increased to 27% in 1994, including nearly 11

Figure 20

Qualifications of Newly Hired[1] Public School Teachers, 1993-94

(Type of state license in main assignment field)



[1]Newly hired teachers include all those hired by schools in 1993-94, excluding those who moved or transferred from one school to another.

[2]A substandard license is an emergency, temporary, provisional, or alternative license issued to someone who has not met the requirements for a standard license.

[3]A probationary license is a license issued to a new teacher who has met all requirements and is completing an initial probationary period.

percent who had no license at all in their main field[65] (see figure 20). These teachers continued to be disproportionately assigned to students in low-income and high-minority schools. Meanwhile, the most highly educated new teachers were hired largely by schools serving the wealthiest students (see figure 21). This continues the habit of assigning the least prepared teachers to students with the least clout and the greatest learning needs while the best prepared teachers are hired by schools serving the most advantaged students.

On virtually every measure, teachers' qualifications vary by the status of the children they serve. Students in high-poverty schools are still the least likely to have teachers who are fully qualified, and are most likely to have teachers without a license or a degree in the field they teach. They are also least likely to have teachers with higher levels of education—a master's, specialist, or doctoral degree.[66] Whereas only 8% of public school teachers in low-poverty schools taught without a minor in their main academic assignment field, fully one-third of teachers in high poverty schools taught without a minor in their main field and nearly 70%

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What Does It Take To Be A Teacher?

Parents might be surprised to learn that the qualifications of their children's teachers are likely to be dramatically different depending on where they live.

In Wisconsin or Minnesota, for example, a prospective high school teacher must complete a bachelor's degree that includes a full major in the subject area to be taught, plus coursework covering subject matter teaching methods, curriculum, learning and development, teaching strategies, uses of technology, classroom management, human relations, and the education of students with special needs. In the course of this work, she would complete at least 18 weeks of student teaching in Wisconsin (a full college quarter or semester in Minnesota) under the supervision of a cooperating teacher who meets minimum standards. In Minnesota, this experience would include work in a multicultural setting and with special needs students. If a teacher were asked to teach outside the field of her major for part of the day, she must already be licensed with at least a minor in that field, and could receive a temporary license in the new field only briefly while completing a major.

As a consequence of this preparation, parents in Wisconsin and Minnesota can be very sure that their children's teachers will know well the subject they are teaching, and they will understand how to present it in a way that takes account of how children learn, how they develop and what they are ready to learn at different stages. They can also have reasonable confidence that their child's teacher will know about teaching techniques that are effective and up-to-date, that motivate students, that use new technologies, and that enable a smooth-running classroom. And they can bet that if their child has a learning difficulty, the teacher will have some idea of how to diagnose the problem and address it.

By contrast, in Louisiana, a prospective high school teacher could be licensed with neither a major nor a minor in the field she was going to teach. The state would not require her to have studied curriculum, teaching strategies, classroom management, uses of technology, or the needs of special education students, and she could receive a license with as little as six weeks of student teaching. If these constraints were too onerous, the aspiring teacher could be hired as one of the 15 percent of entering teachers who receive a license which does not meet the minimal standards that exist. Or she could be hired as one of the 31 percent of new teachers who enter with no license at all.

Parents in Louisiana cannot really be sure what their child's teacher knows about subject matter, children, or the learning process. If a child attends a low-income or predominantly minority school, the odds that his teacher will know little about subjects or students are especially great.

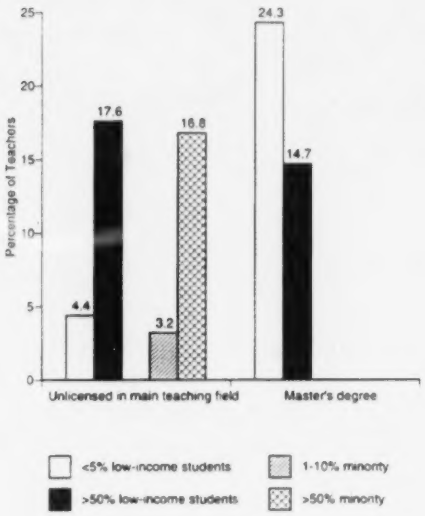
It is no accident that students in Wisconsin and Minnesota score at the top of the country in achievement, while those in Louisiana score near the bottom. As Will Rogers once said: "You can't teach what you don't know any more than you can come back from where you ain't been." Parents might want to know what their child's teacher actually knows.

taught without a minor in their secondary teaching field[67] (See figures 22-24).

Out-of-field teaching remains a serious concern nationwide. Among public high school teachers in academic fields, 21 percent lacked a minor in their main assignment field,[68] including 28 percent of mathematics and 22 percent of English teachers—a slight improvement since 1991—and 18 percent of science and social studies teachers—slightly worse since

Figure 21

Qualifications of Newly Hired Teachers,* by School Type, 1994

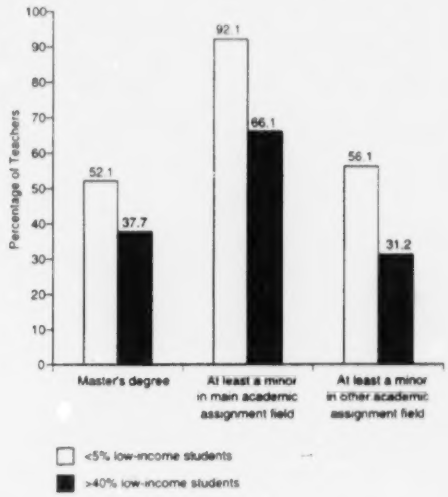


*Newly hired teachers excluding transfers.

Source: Schools and Staffing Surveys, 1993-94. Tabulations conducted by the National Commission on Teaching and America's Future.

Figure 22

Teacher Qualifications by School Type 1994

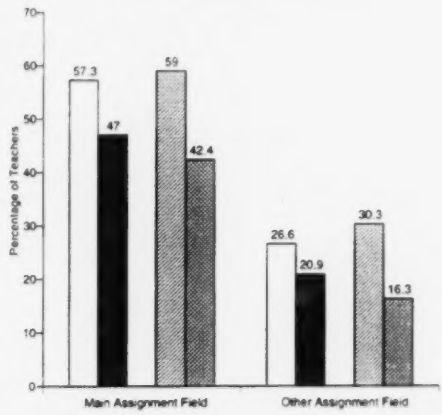


Source: National Center for Education Statistics, *America's Teachers*, Tables 3.5 and A3.2.

Figure 24

Teacher Qualifications by School Type

(Proportion of Teachers with a License and a Degree* in the Field They Teach, 1994)



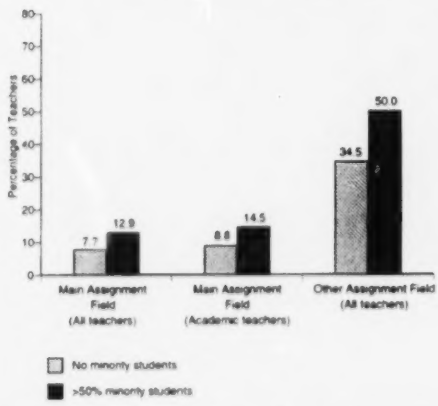
*College major or graduate degree.

Source: NCES, *America's Teachers: Profile of a Profession, 1993-94*, 1997. Tables A8.12, A3.15a and A3.15b.

Figure 24

Teacher Qualifications by School Type

(Percentage of teachers lacking full certification, 1994)

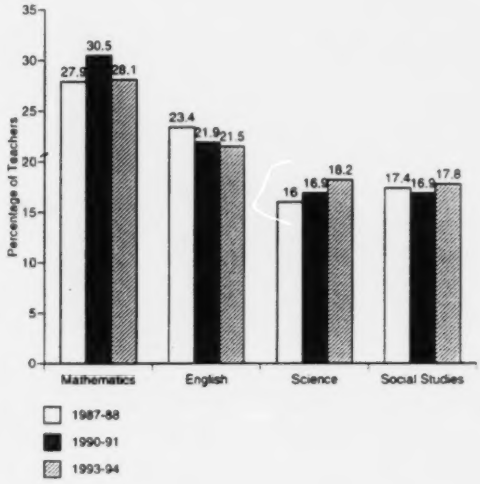


Source: NCES, *America's Teachers: Profile of a Profession, 1993-94*, 1997. Tables A3.15a, A3.15b and A3.14b.

Figure 25

Trends in Out-of-Field Teaching

(Percent of public high school teachers in each field without a major or minor in that field)



Source: Schools and Staffing Surveys, 1987-88, 1990-91, and 1993-94, Teacher Questionnaire. Tabulations by R. Ingersoll for the National Commission on Teaching and America's Future.

1991 (see figure 25). Roughly 20% of secondary teachers in each academic area also lacked state certification in that field, ranging from 17% of science teachers to 24% of mathematics teachers.[69] Proportions of teachers in some kinds of private schools teaching without certification and without a minor in their main assignment area are even larger.[70] This is problematic given the studies that show lower levels of achievement for students whose teachers are not prepared and certified in their subject area.

These problems in the preparation and licensing of teachers are reflected in the performance of U.S. students on international assessments. For example, the U.S. has experienced chronic shortages of mathematics and physical science teachers for more than 40 years and has typically met these problems by lowering standards rather than by increasing the incentives to teach. Between one-fourth and one-third of U.S. mathematics teachers have been teaching out of field for many years. In 1994, just over half of U.S. math teachers had both a license and a major in their field (see figure 27). Given the large number of teachers who are underprepared in mathematics, it should be no surprise that U.S. students continue to compare least favorably with their international peers in this subject, with 8th graders ranking 18th out of 25 countries that met the guidelines for the Third International Mathematics and Science Studies (TIMSS) (see table 3).

U.S. students rank 12th in science out of 25 countries that met the TIMSS guidelines, but 17th in physics. These rankings also appear to be associated with levels of teacher preparation. While general science teachers are relatively well-qualified (only 18% have less than a minor in the field), more than half of physical science teachers are out-of-field by this criterion. As a consequence, 48% of U.S. high school students who take a physical science course are taught by teachers who did not prepare in that field.[71]

On the other hand, U.S. students have compared favorably with students in other countries in reading, ranking at or above the median in 4th and 8th grades. This is partly due to the fact that there have been large investments in teachers' preparation to teach reading at the elementary level—for both reading specialists and "regular" classroom teachers—and there is little hiring of unqualified teachers in these fields. Most districts and schools provide substantial expert support in reading for both teachers and students, while they allocate dramatically fewer resources to similar support in mathematics.[72]

Nationally, there has been little progress in reducing the extent of out-of-field teaching over the last two decades.[73] However, some states have made tremendous strides in continuing to upgrade the qualifications of their teachers. For example, in states like Wisconsin, Iowa, Minnesota, and Montana, at least 80% of teachers in most fields have both full certification and a major in the field they teach, and very few are teaching out-of-field (with less

Table 3

Results from the Third International Mathematics and Science Study

(International Rankings of Countries that met the TIMSS Guidelines)

NATION	MATH AVERAGE	NATION	SCIENCE AVERAGE	NATION	PHYSICS PERCENT CORRECT
Singapore	643	Singapore	607	Singapore	69
Korea	607	Czech Republic	574	Japan	67
Japan	605	Japan	571	Korea	65
Hong Kong	588	Korea	565	Czech Republic	60
Belgium-Flemish	565	Hungary	554	Hungary	60
Czech Republic	564	England	552	England	62
Slovak Republic	547	Belgium-Flemish	550	Slovak Republic	61
Switzerland	545	Slovak Republic	544	Hungary	60
France	538	Ireland	538	Canada	59
Hungary	537	Russian Federation	538	Hong Kong	58
Russian Federation	535	Sweden	535	New Zealand	58
Canada	527	**United States**	**534**	Switzerland	58
Ireland	527	Canada	531	Russian Federation	57
Iran, Islamic Republic	428	Norway	527	Sweden	57
Sweden	519	New Zealand	525	Norway	57
New Zealand	508	Hong Kong	522	Ireland	56
England	506	Switzerland	522	**United States**	**56**
Norway	503	Spain	517	Spain	55
United States	**500**	France	498	France	54
Latvia (LSS)	493	Iceland	494	Iceland	53
Spain	487	Latvia (LSS)	485	Latvia (LSS)	51
Iceland	487	Portugal	480	Lithuania	51
Lithuania	477	Lithuania	476	Portugal	48
Cyprus	474	Iran, Islamic Republic	470	Iran, Islamic Republic	48
Portugal	454	Cyprus	463	Cyprus	46

Source: U.S. Dept. of Education, National Center for Education Statistics, *Pursuing Excellence: A Study of U.S. Eighth Grade Mathematics and Science Teaching, Learning, Curriculum, and Achievement in International Context,* by Lois Peak, 1996.

than a minor).[74] Not surprisingly, students in these states have also ranked at the top of the distribution in mathematics and reading achievement on the National Assessment of Educational Progress for many years. By contrast, states like Alaska, California, and Louisiana, which rank much lower, have many fewer teachers who hold certification plus a major in their field (generally no more than 60%), and large numbers of teachers teaching with less than a minor (more than 40 percent in some fields) (see Appendix B).

In addition to the fact that states have widely varying requirements for licensing, school districts do not always insist on qualifications for teaching. Nationwide, only two-thirds of districts require their new hires to hold at least a college minor in the field to be taught, along with full certification and preparation from a state-approved institution. In some states, like Georgia, fewer than half of all districts insist upon these hiring requirements.[75] In others, like Iowa, Minnesota, Kentucky, and Wisconsin, almost all of them do. On the other hand, some

districts, like New Haven, California, are creating comprehensive systems of recruitment, preparation, and induction to ensure that they get and keep the best-qualified teachers, even in difficult labor markets. (See below.)

Reform of Teacher Education and Induction

In its report, the National Commission noted that a sizable number of universities have undertaken major reforms of their education programs, adding a 5th year of study, creating extensive internships with master teachers in professional development schools, and strengthening coursework in both subject matter disciplines and pedagogy. During the past year, the Commission completed a study of seven extraordinary teacher education programs that prepare teachers who are successful at teaching diverse learners effectively.[76] Based on external evaluations and observations of their practice, the graduates of these programs have also developed pedagogical skills that enable them to teach the challenging material envisioned by new subject matter standards aimed at higher levels of performance and greater understanding.

These teacher education programs are located in public and private universities, across all regions of the country, and at the undergraduate and graduate levels. They share several features that directly confront the limitations of traditional teacher education programs:

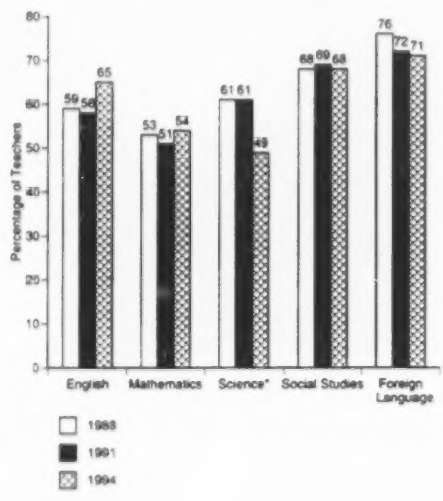
- a common, clear vision of good teaching that is apparent in all coursework and clinical experiences;
- a curriculum grounded in substantial knowledge of child and adolescent development, learning theory, cognition, motivation, and subject matter pedagogy, taught in the context of practice;
- extended clinical experiences (at least 30 weeks) which are carefully chosen to support the ideas and practices presented in simultaneous, closely interwoven coursework;
- well-defined standards of practice and performance that are used to guide and evaluate coursework and clinical work;
- strong relationships, common knowledge, and shared beliefs among school- and university-based faculty;
- extensive use of case study methods, teacher research, performance assessments, and portfolio evaluation to ensure that learning is applied to real problems of practice.

Over the past few years, many other programs have been engaged in redesigning their work to include these features. A growing number of institutions are creating 5-year or 5th-year programs that ensure both a bachelor's degree in a disciplinary field and intensive study of teaching at the graduate level for entering teachers—including a year-long

Figure 26

Trends in Teacher Qualifications

(Percent of Public School Teachers with Full Certification and a College Major in Their Main Assignment Field)



*There was a small change in coding for science teachers between 1991 and 1994, which could account for the sharp change.

Source: S. Bobbitt and M. McMillen, *Qualifications of the Public School Teacher Workforce: 1988 and 1991*. NCES, 1995, p. 15. NCES, *America's Teachers, 1963-1994*, Table A3.15a (corrected).

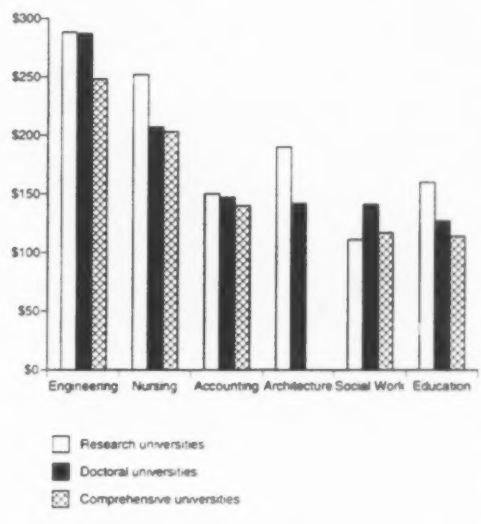
school-based internship connected to education coursework. In doing so, they resolve several traditional dilemmas of teacher education: They create time for study of both subject matter and pedagogy, rather than trading off one against the other. They create room for much more extensive clinical experience—typically 30 weeks or more rather than the traditional 8 to 10 weeks of student teaching. And they reduce fragmentation of the curriculum by interweaving coursework with practical experiences, rather than frontloading theory disconnected from practice.

These institutions join a growing number of countries whose teachers are now prepared in programs that extend to the graduate level, among them France, Finland, Germany, Ireland (secondary), Italy (secondary), Luxembourg, the Netherlands, New Zealand, and Portugal.[77] Many U.S. institutions are taking this step because they believe it will enable them to prepare more effective teachers, but they lack the systemic supports by state governments that their counterparts in other countries enjoy.

At the same time, there are still many programs that operate with inadequate resources, knowledge, and motivation to improve. The Commission report noted the longstanding problem that many universities have treated teacher education as a "cash cow" which is conducted on a shoestring and used to fund programs in other fields. This problem continues to exist. A 1997 study confirms earlier research which found that education programs are funded well below the average, generally near the bottom ranks of departments and well below the level of other professional preparation programs[78] (see figure 27). In addition, the National Center for Education Statistics reports that teacher educators receive lower salaries than other education faculty, who in turn, earn significantly lower salaries than noneducation faculty[79] (see figure 28).

Figure 27

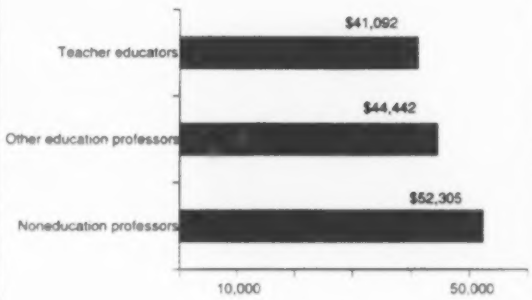
Expenditures in Professional Programs
(Per Undergraduate Student Credit Hour)



Source: Richard Howard, Randy Hitz, and Larry Baker, *Comparative Study of Expenditures per Student Credit Hour of Education Programs to Programs of Other Disciplines and Professions*, 1997.

Figure 28

Average Faculty Salaries by Field



Source: National Center for Education Statistics, *America's Teachers*, p. 31.

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These conditions make it hard to improve the quality of teacher education, while the lack of enforcement of quality standards in many states removes much leverage for change. As we noted in *What Matters Most*, only three states have required professional accreditation of all education schools, and few state agencies have the resources or capacity to evaluate programs

Doing What Matters Most:

The New Haven Unified School District, located midway between Oakland and San Jose, California, serves approximately 14,000 students from Union City and south Hayward, most of them working class. Twenty years ago, the district was the lowest wealth district in a low wealth county, and it had a reputation to match. Today, New Haven Unified School District, while still a low-wealth district, has a well deserved reputation for excellent schools.

Twenty years ago, students who could manage to do so went elsewhere to school. Now, the district has to close its doors to out-of-district transfers because schools are bulging at the seams. Still, families try every trick in the book to establish a New Haven District address. The district has received so many state and national awards that one board member quipped they needed to build a new central office to display all the banners. And when school districts across California scrambled last year to hire qualified teachers, often failing to do so, New Haven had in place an aggressive recruitment system and a high quality training program with local universities that allowed it to continue its long-term habit of hiring well-prepared, committed, and diverse teachers to staff its schools.

Of the many factors contributing to the district's success with students, one key was an early recognition of the essential role of teachers and a set of systemic policies in support of quality teaching. Although the district's work began decades before the publication of *What Matters Most*, New Haven has, in its own way, met most of the challenges laid out in that report.

First, New Haven got serious about standards. One of several things the district did more than 20 years ago was to establish high expectations for teachers in terms of both hiring and ongoing performance. They then got serious about assessing teaching—and provided necessary supports for teachers to meet the expectations. The move drew criticism, but it sent an unwavering message that the district was committed to assuring students the teachers they deserved.

Second, the district invested in teacher education. Alongside the required *Educational Leadership* journal in the personnel director's office are well worn copies of the *The Journal of Teacher Education* and *Teacher Education Quarterly*. The district was one of the first in the state to implement a Beginning Teacher Support and Assessment Program that provides support for teachers in their first two years in the classroom. In addition, district leaders foresaw student population growth and California's 20:1 class size initiative. With the support of California State University, Hayward, the district designed an innovative teacher education program that combines college coursework and an intensive internship conducted under the close supervision of school-based educators. Because interns function as student teachers who work directly with master teachers, rather than as teachers of record, the program simultaneously educates teachers while protecting students and providing quality education.

Third, New Haven recruits quality teachers. With the wise and humane use of technology,

and enforce high standards through their program approval process. Candidates are licensed if they graduate from a state-approved program, and virtually all programs, regardless of their quality, are state-approved. Several more states have taken steps this year to intervene in this vicious cycle by upgrading their standards for licensing and accreditation of programs, and

Ensuring Quality Teaching at the District Level

the school district recruits from a national pool of exceptional teachers. The district just received the prestigious C. S. Robinson Award from the American Association of School Personnel Administrators for exemplary use of technology in recruiting. The district's use of technology actually personalizes the entire personnel function. For instance, their engaging and educational web site draws inquiries from around the country. Each inquiry receives a personal e-mail response. With the use of electronic information transfer (for example, the personnel office can send applicant files to the desktop of any administrator electronically), the district can provide information to people urban districts might never think would be available to them—let alone immediately with a stroke on the keyboard. Despite the horror stories one often hears about the difficulty of out-of-state teachers earning a California teaching credential, New Haven's credential analyst in the personnel office has yet to lose a teacher recruited from out-of-state in the state's credentialing maze.

Fourth, the school system rewards knowledge and skill. The district provides multiple intangible rewards for teachers—not the least of which is broad-based community support of schools. The district also puts its money where its mouth is. Although it remains one of the two lowest wealth districts in its county, New Haven offers the highest salary scale in the area. In addition, the district staffs classrooms creatively and flexibly so that classroom teachers, while working with children, also enact the internship program and the beginning teacher support and assessment program; develop curriculum; design technological supports; and create student standards, assessments, and indicators of student learning. Teaching in New Haven is conceived as truly professional work.

Finally, New Haven organizes schools around student and teacher learning. With the information the district can gather and analyze with its technological capacities, the district implemented a district-wide extended day program offered on a sliding scale so that all families can participate. The schools are open from dawn until dark providing educational experiences connected with the school program, as well as traditional enrichment activities and clubs. To ensure opportunities for teacher learning, the district opens schools 90 minutes late on Wednesday mornings. Each Wednesday morning, in every school in the district, teachers gather in collaborative teams to teach and learn with each other. As another example of the district putting its money where its mouth is, New Haven's computer expert estimates that for every dollar spent on machinery and software, the district invests another dollar in supporting the teachers' use of those tools.

Taken together, these actions have helped create a district that succeeds with students and inspires confidence from parents. The results of these investments in what matters most have resulted in extraordinary support from the community, which has passed the past three bond levies with more than a two-thirds vote. In a state that has been voting down school taxes for more than twenty years, New Haven voters believe in their schools—and in the benefit they provide to both children and the community.

by creating resources and incentives to encourage universities to take seriously the education of prospective teachers. Fifteen states now use NCATE's national professional standards as the basis for state program decisions.

In addition, more states are creating induction programs to provide mentoring and support for beginning teachers. Among teachers with less than 5 years of experience, 55 percent report that they experienced some kind of formal induction program during their first year of teaching.[80] By contrast, only 16 to 17 percent of teachers with more than 10 years of experience had had such help when they entered the profession.[81] Like all other education policies, however, access to induction programs varies widely across the country. More than ¾ of beginners report having experienced induction supports in states that put such programs in place several years ago—Connecticut, Florida, Indiana, Kentucky, Missouri, North Carolina, Oklahoma, and Pennsylvania. However, in states like Rhode Island and Massachusetts that have relied only on local initiatives, fewer than 15% of beginning teachers have received any kind of systematic mentoring.

Access to Professional Development

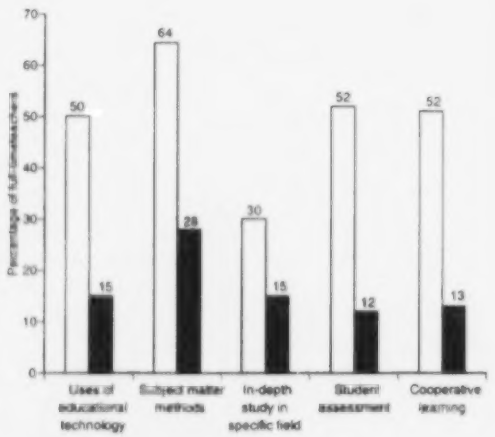
Teachers' later access to professional learning opportunities also varies substantially. Nationally, relatively few teachers have access to sustained, intensive professional development about their subject matter, teaching methods, or new technologies. In 1994, about half of all teachers had some exposure to professional development regarding the uses of educational technology, student assessment, or cooperative learning; however, most of these learning opportunities were extremely short-term—usually one-time workshops. Only a small fraction of teachers (15% or fewer) spent at least nine hours engaged in any of these areas of learning (see figure 29). This is probably because the vast majority of professional development opportunities were district-sponsored workshops that are typically delivered as one-day events.[82]

In addition, while more teachers (about 64%) had at least brief exposure to some study of teaching methods, only about 30 percent engaged in in-depth study in their subject matter field. This is particularly important given the current emphasis on new student standards in the disciplines and the critical need for teachers to develop a broad repertoire of methods for teaching a wider range of students to succeed with much more challenging material.

Teachers are remarkably positive about any and all opportunities for learning. The great majority (85%) report that whatever professional development they encountered provided them with new and useful information. Although somewhat fewer report that the learning opportunities they experienced changed their practice (65%), almost none report that they were a waste of time (11%).[83]

Access to professional development varies

Figure 29
Teacher Participation in Professional Development 1993-94



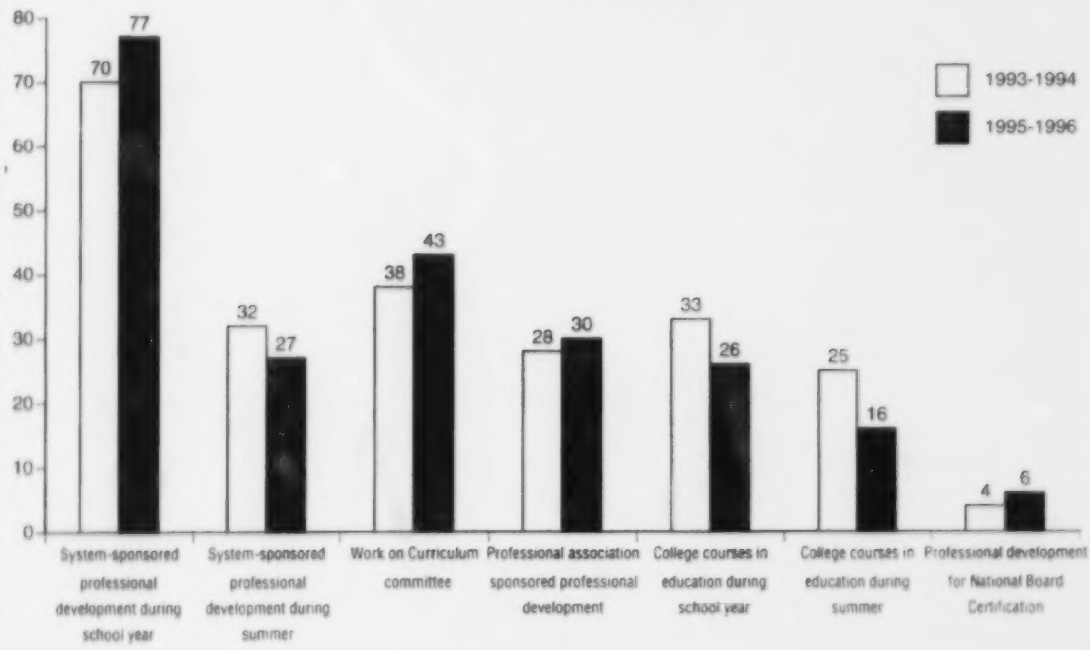
Source: National Center for Education Statistics, *Schools and Staffing Surveys*. Public School Teacher questionnaire. Tabulations by National Commission on Teaching an dAmerica's Future.

substantially across states. In recent years, Kentucky has had the most widespread professional development opportunities of any state: In 1994, more than 70 percent of teachers in Kentucky reported that they had pursued professional development opportunities regarding uses of technology, teaching methods, student assessment, and cooperative learning. Kentucky teachers were also more likely than most others to say that the professional development they experienced changed their practice.[84] By contrast, only one-third of teachers in Arkansas and Nevada had had any opportunity to learn about uses of technology; and only 10 percent of teachers in Illinois, New Mexico, or Tennessee had the chance to spend more than one day studying their subject area (see Appendix B).

In recent years, participation in certain kinds of professional development seems to have increased, while engagement in other kinds has declined. More teachers participated in professional development sponsored by their school district during the school year in 1996 than in 1994 (up to 77% from 70%), but fewer participated in such professional development during the summer. Between 1994 and 1996, a growing number of teachers worked on curriculum committees, engaged in learning activities sponsored by professional associations, and participated in professional development aimed at National Board Certification (see figure 30). The fact that 6% of public school teachers participated in professional development related to National Board Certification means that, although fewer than 1,000 teachers have thus far

Figure 30

Participation in Professional Growth Activities
(Percent of Teachers, 1994 to 1996)



Source: NEA, *Status of the American Public School Teacher*, 1995-96, pp. 248-252.

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received certification, at least 160,000 have taken steps to prepare for it. Meanwhile, a number of universities have begun to develop advanced Master's degree programs based on the National Board's Standards which will support teachers in developing more accomplished teaching practice.

At the same time, the proportion of teachers taking college courses in education or in other fields during the school year and during the summer has declined noticeably.[85] Whether this is because teachers were less interested in taking such courses, because more teachers are entering having already completed their master's degree, or because school districts offered less support for college course-taking is not known. The 40 percent of teachers who did take college coursework over the last three years spent an average of about $2,000 of their own money for tuition and expenses.[86]

There are promising signs that, at least in some schools, teachers have growing access to opportunities to learn which are helpful to them and their students. The continuing issue for professional development is how to make more sustained, in-depth opportunities for teacher learning more widely and routinely available in schools across the country.

Progress in School Reform

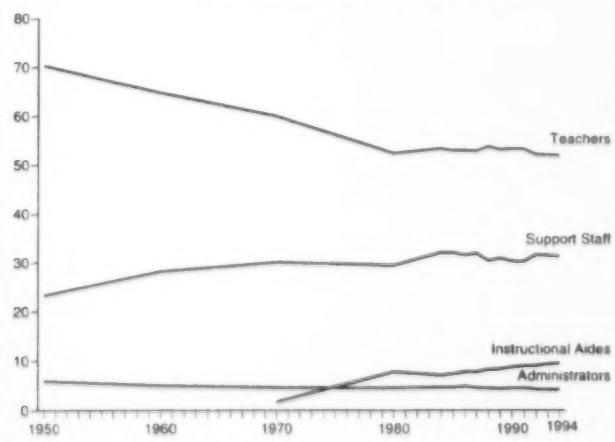
Teachers need not only knowledge and skills but also conditions in which they can teach well. These include common standards for student learning, more continuous and extended time for working with students and families, and more time for collaborative planning and learning with other colleagues. As we described in *What Matters Most*, schools that focus on in-depth learning for students and teachers have enacted curriculum changes, redesigned schedules, and new patterns of staffing and resource use, including investments in teaching and technology rather than nonteaching functions. In order to afford both smaller pupil loads for teachers and greater time for collegial work, more of the staff who are now working in pull-out programs, administrative roles, and support offices need to be working in the classroom, as they do in most other industrialized countries.

The extremely bureaucratic organization of U.S. schools seems to be changing slowly, if at all. In 1994, the proportion of school staff who were teachers had continued its steady decline since 1950 (see figure 31). Among the 52% of staff who were classified as teachers, only about 43% were regularly assigned as classroom teachers. This explains why, even though the ratio of pupils to instructional staff is 13 to 1, average class sizes remain at about 24 and reach 35 or more in many central cities, and teachers still have almost no time to consult with one another.[87]

Despite these constraints, most teachers report that their schools are working on a variety of school reforms, including the use of a broader range of teaching methods and assessment methods, an expansion of the "basics" to include computer literacy and problem solving, and the greater involvement of teachers and principals in decision making concerning

Figure 31

Proportions of Staff by Functional Area



Source: NCES, *Digest of Education Statistics, 1996*, Table 81.

scheduling, curriculum, personnel, and budgets. Over 70% of teachers report at least partial implementation of reforms in these areas, but many fewer see their schools as having fully implemented these changes, and fewer still report much progress on flexible scheduling designed to promoted more in-depth, integrated learning or the use of criteria for mastery rather than seat time as the basis for gauging student progress[88] (see figure 32).

The use of technology in school is also increasing slowly. In 1995, only about one-fourth of teachers were using computers or calculators in the classroom[89] while over 87% used the blackboard. Teachers and students were less likely to use computers in secondary schools than in elementary schools. As we noted earlier, teachers are still not getting enough inservice training to use technology. A recent review of state policies found that, while 44 states reported that they require or recommend integrating technology into the curriculum, only Alabama and the District of Columbia require inservice training in technology for all teachers. State budgets for technology supports vary greatly: some state educational technology budgets amount to several million dollars, while other state budgets would not cover more than a single staff person.

When asked what would help them use technology better, teachers who responded to a survey by the Office of Technology Assessment[90] cited the need for more knowledge about how to use technologies and more knowledge about how to organize and manage their students in technology-based school environments. Several factors were found to influence teachers' use of technology: 1) access to technology; 2) on-site technical support; 3) technology training; and 4) school time for instructional integration and planning. Several new state and federal initiatives tackle these conditions head-on, and may make an important difference for bringing schools into the information age in ways that really transform students' and teachers' opportunities to learn.

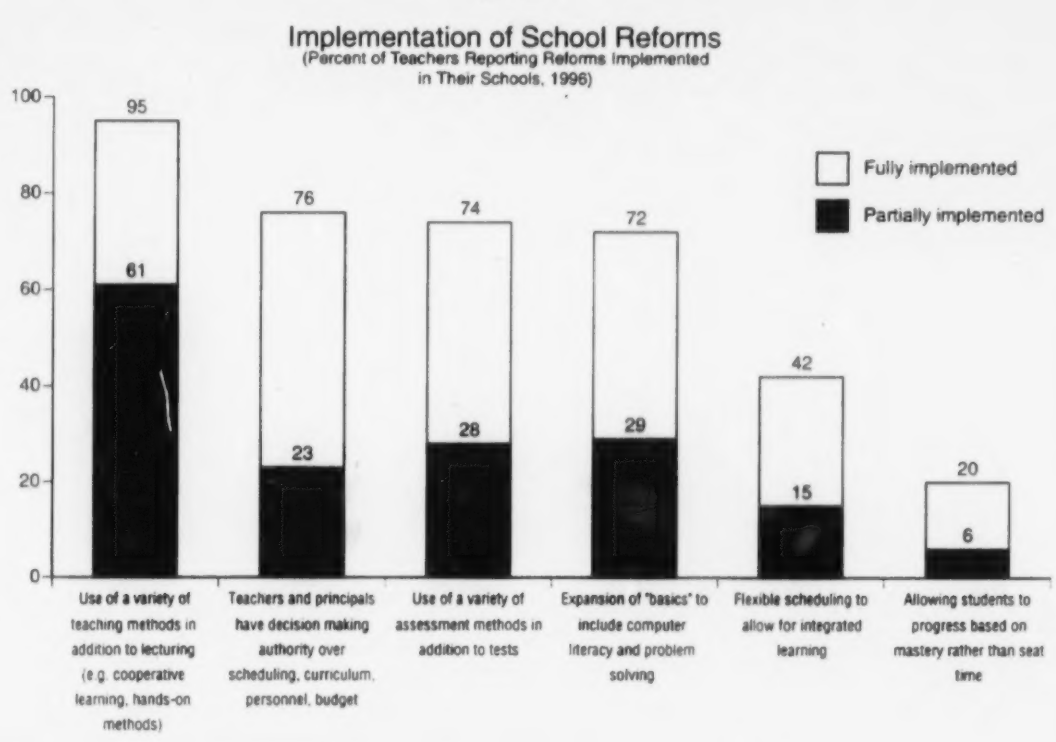
Evidence of Progress: Federal, State, and Local Initiatives

While there is a long way to go, important progress is being made in all of these areas with the leadership of policymakers, practitioners, and concerned public members across the country. Organizations like the National Governors Association, the National Conference of State Legislatures, the Education Commission of the States, the National Education Association, the American Federation of Teachers, the American Association of Colleges for Teacher Education, the National Urban League, and a wide range of associations representing state and local boards, administrators, subject matter teachers, and parents have engaged their members in serious consideration of the issues associated with teaching standards, teacher accountability, and support for teacher learning and performance. Almost every major metropolitan news outlet featured stories about teaching quality when children returned to school this fall, a sign that the public is getting serious about what matters most. Most states and many school districts undertook renewed steps to focus on teaching quality, as did the United States Congress. Americans seem ready to work on this agenda.

Federal Initiatives: Investing in Recruitment and Preparation

The National Commission's recommendations are reflected in five federal legislative proposals in the current (1997) Congressional session and a bevy of enactments in state and local districts. All of the federal proposals revise Title V of the Higher Education Reauthorization Act, a compendium of 20 teacher education and recruitment provisions of which only one, a $2.2 million teacher recruitment pro-

Figure 32



Source: NEA, *Status of the American Public School Teacher*, 1995-96, p. 89.

gram, has ever been previously funded.

The Clinton Administration included in its legislative package a bill aimed at improved teacher preparation and recruitment in urban and rural schools.[91] The Lighthouse Partnerships for Teacher Preparation and Teacher Recruitment for Underserved Areas bill (S. 1209) authorizes $350 million to subsidize the preparation of 35,000 teachers who agree to work for at least three years in hard-to-staff urban and rural schools in high-poverty areas. Their preparation would be supported through competitive grants to colleges and universities with exemplary teacher education programs.

The TEACH Act (Teacher Excellence in America Challenge Act of 1997, S. 1169), introduced by Senator Jack Reed (RI), would provide competitive grants for school-university partnerships that launch professional development schools to improve teacher preparation, induction, and professional development. Priority would be given to schools serving high percentages of low-income children and to efforts that help teachers work with diverse student populations, implement research-based practices that improve student achievement, prepare teachers to use technology to help students achieve to high standards; and involve parents.

America's Teacher Education Improvement Act (S.1201), introduced by Senator William Frist (TN), is designed to replace Title V except for the existing minority recruitment provision. S. 1201 authorizes $250 million a year over four years to fund educator recruitment, preservice education, and induction. The bill encourages partnerships among teacher preparation programs and other campus units, community colleges, schools, and community organizations, among others.

The Teaching Excellence for All Children Act (H.R. 2228) was introduced by Representative George Miller (CA). The bill would give parents the right to know the qualifications of their child's teacher and would require colleges receiving federal funds for teacher training to become nationally accredited or provide evidence that at least 90 percent of their graduates pass state licensing requirements. Graduates who teach in high-poverty schools could have student loans forgiven, and school districts in high-poverty areas could form partnerships with colleges to provide intensive teacher training through a Beginning Teacher Recruitment and Support Program.

The Technology for Teachers Act (S. 839), introduced by Senator Jeff Bingaman (NM), is aimed at ensuring that teachers get the training they need to make effective use of technology in the classroom. It would fund partnerships among colleges, school districts, state education departments, and the private sector to improve the preparation of both preservice and inservice teachers in the use of the latest education research and the most current technology available.

Each of these bills tackles different aspects of the Commission's recommendations concerning standards, recruitment, preparation, professional development, and school restructuring. Action on all of them would move the country a giant step closer to meeting the goal of assuring each student a qualified, competent, caring teacher by the year 2006.

State Actions: Transforming Standards and Systems for Teaching

States are getting serious about standards for teaching. By the fall of 1997, 41 states had entered into partnerships with the National Council for the Accreditation of Teacher Education (NCATE) and nine had required accreditation of all public institutions. In part because of these actions, 51 teacher education institutions decided to undertake accreditation review this year, joining the 500 already accredited. Meanwhile, NCATE announced its plans to move to performance-based accreditation by the year 2000, revamping standards so that they focus more on evidence of candidate knowledge and demonstrated teaching skill and less on measures of inputs and process.

More than 20 states had adopted or adapted INTASC standards for licensing beginning teachers, and 18 were engaged in developing or piloting new assessments based on these standards. Twenty-six states and more than 70 districts had enacted incentives for teachers to pursue National Board certification. The number of Board-certified teachers reached 911 by November, 1997. Meanwhile, more than 150,000 teachers participated in professional development aimed at Board certification. Increased federal appropriations have allowed the Board to launch 5 more certificates for the 1998-99 school year and complete 26 certificates (covering 95% of all teachers) by the year 2000.

The Commission's twelve partner states undertook a wide-ranging set of reforms affecting almost all aspects of teaching. *North Carolina* passed the ambitious Excellent Schools Act of 1997, which enacted nearly all of the recommendations of the National Commission that were not already in place in the state. The Act ties higher salaries for teachers to higher standards and creates greater learning opportunities as it:

- *increases salaries* by an average of 33 percent over 4 years;
- *strengthens licensing* by creating a three-tiered system of initial, continuing, and advanced certification tied to performance assessments;
- *establishes rewards for knowledge and skills* by providing additional salary increments for passing assessments for a continuing license after 3 years, passing tenure review after 4 years, obtaining National Board certification (for which teachers earn a 12%

increase), and earning a master's degree;

- *improves teacher education* by raising entry standards, establishing school-university partnerships to create clinical school settings, requiring special education training for all newly prepared teachers, and revising master's degree programs;
- *enhances mentoring of beginning teachers* by setting standards for the selection of mentor teachers and providing funds to train and compensate mentors; and
- *funds professional development tied to student standards.*

Another initiative will create professional development school partnerships for the clinical training of beginning and veteran teachers at all 15 North Carolina public teacher education institutions by the year 2000, a far-reaching endeavor that is already well underway.

Since September of 1996, *Ohio* has also put in place a comprehensive new infrastructure for preparing, licensing, and promoting the professional development of teachers. Following extensive groundwork laid by public committees, the State Board and legislature enacted policies[92] that:

- *adopt performance-based standards for teacher licensing* compatible with INTASC and National Board standards. These rigorous standards spell out what teachers should know and be able to do; they will be tied to performance assessments for an initial and continuing license.
- *require teacher education programs to meet NCATE standards* and to demonstrate that their graduates can meet the new licensing standards and performance assessments;
- *provide mentors for all beginning teachers and principals* and require that beginners pass performance assessments evaluated by state assessors to receive a professional license;
- *require license renewal every five years* based on professional development approved by newly-established local professional development committees comprised of teachers and administrators;
- *require a master's degree or the equivalent* within 10 years of entry into the profession;
- *support National Board certification* by underwriting fees for 400 teachers in 1997-98, allocating $30,000 to each of 10 higher education institutions providing assistance to candidates, and paying an annual $2500 stipend to those who are certified;
- *encourage peer review and assistance* through competitive grants to school systems that implement peer review programs and fund training for mentor teachers at regional professional development centers.

In addition, the state has taken steps to enable schools to develop new forms of organization and scheduling that will better support student and teacher learning. The *Venture Capital* program has provided funds for more than 500 schools to create fresh approaches to curriculum, teaching, scheduling, governance, and professional development. This school year, 11 school districts have been selected to launch a new *Standards Deregulation Pilot Program* that will give them greater freedom to innovate in exchange for continued high performance and improvement under the proposed Standards for Ohio's Schools. Finally, the State Board of Education has authorized the waiver of rules that constrain scheduling and school structure to provide flexibility needed to create time for professional development.

Oklahoma sharply expanded its appropriations to the Commission for Teacher Preparation for implementing a *competency-based program of teacher licensure* and for launching *professional development institutes*, the first of which will focus on the teaching of reading. Subsequent institutes will be established to focus on the teaching of mathematics, the teaching of inquiry-based science, the use of technology in the classroom, and the training of mentors for beginning teachers. The state also established an Education Leadership Program to assist teachers in seeking *National Board Certification* by creating training programs in universities; paying for assessment fees and scholarships to

support released time, travel, and other costs; and paying a $5,000 salary increment for Board-certified teachers.

A number of states have redesigned teaching standards and created partnerships with universities and schools to incorporate the new standards into preparation and professional development programs. *Maryland's* State Board of Education has launched a Redesign of Teacher Education which includes adoption of *NCATE standards* for accreditation of education programs, *INTASC-based standards* as the basis for new performance assessments for licensure, and *National Board standards* for ongoing professional development. The Board approved a budget request to launch 240 new *professional development schools* to expand upon the current efforts of its thirteen universities. All prospective teachers will ultimately be expected to complete a year-long internship in such a school. The legislature also enacted fee incentives and continuing education credits for teachers pursuing *National Board Certification.*

Kansas completed a plan for the *redesign of teacher licensure* that is also standards-based, compatible with the INTASC and National Board standards, and embedded in a continuum of teaching standards and ongoing professional development. It will create a new induction program and hold teacher education programs accountable for the performance of their graduates. The Kansas Teacher Development Coalition housed at the University of Kansas, a collaboration of state agencies, higher education institutions, and other educators, is working on aligning preservice education and induction-related professional development with this redesign. Meanwhile, each of the six Regents institutions has established professional development school partnerships for the clinical preparation of new teachers.

Indiana's Professional Standards Board has also adopted a set of *interlocking standards* based on NCATE, INTASC, and National Board standards for accreditation, licensing, and professional development. These will be linked to performance-based assessments. In June 1997, the Board approved the design of an assessment system for preservice education, licensure, and relicensure. The Indiana Alliance, a network of six school-university partnerships, is working to align preservice education with the NCATE and INTASC standards, and to stimulate professional development and assessments of teachers in schools consistent with the National Board standards.

Maine also developed *new standards for teacher licensing* that are based on the INTASC standards and tied to Maine's Learning Results for Children. Eight colleges are developing and piloting performance-based assessments of the standards. *Kentucky* began implemention in 1996 of its new *performance-based licensing and accreditation requirements* with performance assessments in schools of education. These assessments and the Kentucky Teacher Internship program, which provides a trained mentor teacher for each beginner, are based on standards that reflect the Kentucky Education Reform Act (KERA) reforms.

The *Illinois* State Board of Education adopted a *standards-based framework* for redesigning preparation, licensing, and professional development relying on INTASC and National Board standards. Six advisory groups of over 200 educators, parents, business and community leaders developed specific strategies to implement the framework. Nine pilot sites are aligning preservice education with INTASC standards, and funds have been provided to create school-univeristy partnerships. Schools receiving technology funds must devote at least 25% to professional development. Institutes on student and teacher standards in the areas of reading, math, and science are being initiated this year, along with supports for National Board Certification.

Montana's Commission on Teaching has also approved recommendations for supporting *National Board Certification*, including renewal units toward state recertification, scholarships to support fees, and a salary bonus for success-

ful candidates. Several universities have created support programs for teachers pursuing certification and are aligning their preparation programs with National Board standards. The state has developed a pilot program for *teacher mentoring* and a guide for teacher mentors.

Georgia's Board of Regents has made teacher preparation its top priority for the 1997-98 year. The Board already requires all public schools of education to be nationally accredited. This past year, the state took further steps toward systemic teacher education reform through challenge grants to local P-16 councils that work on the co-reform of schools and teacher education. Three of these sites will be pilots for a national initiative to link K-12 content standards with standards for teacher education and the strengthening of content pedagogy in collaboration with the Council for Basic Education and the American Association of Colleges for Teacher Education.

Missouri has added new incentives for school reform to the initiatives launched in 1993 by the Outstanding Schools Act, which allocated 1 percent of state appropriations and another 1 percent of local funds to professional development. This past year, the Missouri Association of School Administrators and the University of Missouri-Columbia, in collaboration with the state, created a *Superintendents' Institute* to help prepare leaders as change agents who are knowledgeable about innovation, the process of change, and successful practices. New *incentive grants for innovation* will also help schools and districts implement programs based on powerful theories of teaching and learning, adapt innovations proven successful elsewhere, and disseminate practical solutions to persistent problems. The state continues to deepen its teacher education reforms by creating *professional development schools (PDS)* through its Regional Professional Development Centers. The Commission on Teaching is considering PDS standards, a statewide support network, and a stable funding structure for professional development schools.

Many other states enacted policies in 1997 in support of higher quality teaching. *Alabama* raised teacher salaries; *Arkansas* passed ambitious legislation that raised teacher salaries and improved benefits, created supports for National Board Certification, and increased teacher planning time; *California* expanded its beginning teacher program, created supports for National Board Certification, and expanded recruitment incentives for teachers; *Colorado* authorized the issuance of a license to any National Board Certified teacher; *Connecticut* developed new performance-based licensing rules, became a partner state with NCATE, and expanded its requirements for inservice professional development; *Florida* revised its state licensing requirements to incorporate evidence of teacher proficiency; *Massachusetts* enacted new testing requirements for teacher licensure and provided grants to districts for mentoring and assessing beginning teachers; *New Jersey* passed the Education Technology Teacher Training Program, strengthening teachers' preservice and inservice preparation in the use of new technologies; *North Dakota* improved teachers' retirement benefits; *Rhode Island* has introduced new, INTASC-compatible standards for beginning teachers and requirements for portfolio assessments of preservice teachers; *South Carolina* raised teachers' salaries, enacted incentives for National Board Certification, and charged the State Board with upgrading standards for teacher education programs, enacting tests for licensure, and developing an induction program for beginning teachers; *Virginia* passed supports for teacher technology training and created a scholarship program for recruiting minorities to teaching; *Washington* strengthened standards governing the probationary period for beginning teachers and the relevance to teaching of professional development courses pursued for experience credits; and *West Virginia* created a scholarship program to recruit teachers in high-need areas.[93]

Conclusion

Every September, parents ask the same, important questions. Who is teaching my child? Will my child's teacher inspire her? Will she look after his individual needs? Will this teacher help her learn all the necessary basic skills, as well as how to think and problem solve as she will need to in the years ahead? Will my child's teacher be knowledgeable not only about the subjects he teaches, but about the children he teaches as well?

Much progress has been made over the last year toward answering these questions in the affirmative. However, much more work needs to be done. More parents need to demand that their children and other children are taught by well-prepared and qualified teachers. More business leaders need to demand that schools invest in teacher development, just as they invest in their own employees. More policy makers need to make quality teaching and the recruitment of well-prepared teachers their number one education priority. More college faculty need to redesign their preparation programs, and more college presidents need to invest in the quality of training they provide prospective teachers and principals. More school leaders need to draw upon the best practices available to create a coherent system of teacher development at the state and local levels. And more teachers need to insist that their occupation become a true profession—a profession that supports their commitment by guaranteeing them access to the knowledge they need to help their students succeed.

With perseverance and determination, we can take the remaining steps needed to ensure that our students have a genuine right to learn—a right made real by their opportunity to study with a caring, competent, and committed teacher.

Endnotes

[1] National Commission on Teaching and America's Future, *What Matters Most: Teaching for America's Future*. NY: Author, 1996.

[2] These include the National Center for the Study of Teaching and Policy to be housed at the University of Washington, working in collaboration with Columbia University, Teachers College, Stanford University, and the University of Michigan, and the National Partnership for Excellence and Accountability in Teaching, organized by the University of Maryland in collaboration with several major universities and a large number of professional associations who will work together to connect research and practice on behalf of improved teaching.

[3] William Schmidt, Curtis McKnight, and Senta Raizen, *A Splintered Vision*. Kluwer Academic Publishers, 1996.

[4] Lynne Paine and L. Ma, "Teachers Working Together: A Dialogue on Organizational and Cultural Perspectives of Chinese Teachers," *International Journal of Educational Research* (1993), pp. 675-697.

[5] Organization for Economic Cooperation and Development, *Education at a Glance: OECD Indicators*. Paris: Author, 1995.

[6] For examples, see Linda Darling-Hammond, *The Right to Learn: A Blueprint for Creating Schools that Work*. San Francisco: Jossey Bass, 1997; Karen Hawley Miles and Linda Darling-Hammond, "Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools," *Educational Evaluation and Policy Analysis*, in press.

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[33] Some other states that posted greater than average achievement gains at either grade 4 or 8 may not have stable scores, either because they did not satisfy one or more of the NAEP requirements for school participation rates (Arkansas, Maryland, Michigan, New Jersey, New York) or because they included fewer than 45% of their students with disabilities in the assessments, according to NAEP's original inclusion criteria (Arkansas, Colorado, Kentucky, Michigan, Mississippi, Texas, West Virginia). National Center for Education Statistics, NAEP 1996 *Mathematics Report Card*, 1997, Table D.3.

[34] National Center for Education Statistics, *Schools and Staffing Survey, 1993-94. State-by-State Data*. Washington, D.C.: U.S. Department of Education. Table 3.5. Additional tabulations performed by the National Commissionon on Teaching and America's Future are presented in Appendix B.

[35] For a description of Minnesota's reforms see Linda Darling-Hammond, Arthur E. Wise, and Stephen Klein, *A License to Teach: Building a Profession for 21st Century Schools*. Boulder: Westview Press, 1994.

[36] For data on state standards and teacher qualifications see Appendices A and B of this report.

[37] National Center for Education Statistics, *Projections of Education Statistics to 2007*. Washington, D.C.: U.S. Department of Education, 1997.

[38] NCES, *America's Teachers*.

[39] According to the U.S. Department of Education's projections, the number of teaching positions will grow by about 350,000 between 1995 and 2007 (from 2.99 million to 3.34 million using the middle alternative projections). These positions will require about 30,000 teachers per year. (NCES, *Projections of Education Statistics to 2007*). In addition, attrition from teaching was 6.6 percent for public school teachers in 1994, and just over 7 percent for public and private school teachers combined. (NCES, *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey, 1994-95*). If attrition continued at a conservatively estimated rate of 6 percent over each of the coming years, the number of vacancies to be filled due to attrition would range from about 180,000 to 200,000 annually. Adding the growth in new positions (30,000 per year), total demand would range from 210,000 to 240,000 annually, and thus from 2.1 million to 2.4 million over the course of the decade.

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[40] NCES, *America's Teachers*, pp. 97-98. About 3/4 of graduates who applied for teaching positions received offers and 90% of those who received offers accepted them (about 67% of all applicants). Interestingly, a number of recent bachelor's degree recipients who had prepared to teach reported they had not completed all requirements for entering teaching, probably reflecting the fact that many states now require tests and some graduate study before licensure. Of those who prepared to teach in undergraduate school but did not do so in the year after graduation, 33% said they had not taken or passed the necessary tests, 24% said they needed to obtain more education, and 2% felt they were not yet ready.

[41] NCES, *America's Teachers*, p. 97.

[42] NCES, *America's Teachers*, Table A8.11.

[43] Connecticut State Department of Education Division of Research, Evaluation, and Assessment, *Research Bulletin School Year 1990-91 No. 1*. Hartford, CT: Bureau of Research and Teacher Assessment, 1991.

[44] National Board for Professional Teaching Standards, *National Board Certification: Incentives and Rewards*, Updated November 1997.

[45] America's Teachers, p. 101.

[46] NCES, *America's Teachers*, pp. 101-102.

[47] Karen Hawley Miles and Linda Darling-Hammond, "Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools," *Educational Evaluation and Policy Analysis*, in press.

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[49] In 1994, bachelor's degree recipients who prepared to teach had higher GPAs than the average college graduate. NCES, *America's Teachers*, p. A-52.

[50] NCES, *The Condition of Education, 1997*, pp. 178, 412.

[51] Recent College Graduates Surveys, 1987 and 1991; National Center for Education Statistics, *The Digest of Education Statistics, 1996*, p. 412. Washington, D.C.: U.S. Department of Education, 1996.

[52] National Education Association, *Status of the American Public School Teacher, 1995-96*, p. 42.

[53] NCES, *America's Teachers*, pp. A-119 and A-128.

[54] NCES, *America's Teachers*, Tables A4.15-A4.16.

[55] Schools and Staffing Surveys, 1993-94. *Public School Teacher Questionnaires*. Tabulations conducted by the National Commission on Teaching and America's Future.

[56] National Center for Education Statistics, *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey, 1994-95*. Washington, D.C.: U.S. Department of Education, 1997.

[57] NCES, *Characteristics of Stayers, Movers, and Leavers*, pp. 6-7.

[58] NCES, *America's Teachers*, p. 109.

[59] Low-poverty schools are those with less than 5% of their students receiving free or reduced-price lunch. High-poverty schools are those with more than 50% of their students receiving free or reduced-price lunch. Schools and Staffing Surveys, *Teacher Followup Survey 1994-95*, Tabulations conducted by the National Commission on Teaching and America's Future.

[60] NCES, *America's Teachers*, p. 91.

[61] NCES, *America's Teachers*, p. 93.

[62] NEA, *Status*, p. 62.

[63] NCES, *America's Teachers*, Table A4.15.

[64] NCES, *America's Teachers: Profile of a Profession, 1990-91*. Washington, D.C.: U.S. Department of Education, 1993; Schools and Staffing Surveys, 1993-94, *Public School Teacher Questionnaires*. Tabulations conducted by the National Commission on Teaching and America's Future.

[65] In 1994, these statistics included 10.7 percent of newly hired, non-transferring public school teachers (new hires who had not been teaching the year before) who had no license in their main field, plus 16.3 percent who were hired on substandard licenses (emergency, temporary, provisional, or alternative licenses). Tabulations conducted by the National Commission on Teaching and America's Future using data from the Schools and Staffing Surveys, 1990-91 and 1993-94, *Public School Teacher Questionnaires*.

[66] NCES, *America's Teachers, 1993-94*, p. 30.

[67] NCES, *America's Teachers, 1993-94*. Tables 3.5 and A3.

[68] Schools and Staffing Surveys, 1993-94, *Public School Teacher Questionnaire*. Tabulations conducted by the National Commission on Teaching and America's Future.

[69] These proportions include all teachers who teach any courses in the field, not just those whose main assignment is in that field. Schools and Staffing Surveys, 1993-94, *Teacher Questionnaire*. Tabulations conducted by the National Commission on Teaching and America's Future.

[70] NCES, *America's Teachers, 1993-94*, p. A-48.

[71] Schools and Staffing Surveys, 1993-94. Tabulations conducted by the National Commission for Teaching and America's Future.

[72] J. Price and Deborah Ball, " 'There's always another agenda': Marshalling resources for mathematics reform," *Journal of Curriculum Studies* (in press).

[73] NEA, *Status*, p. 32.

[74] See Appendix B.

[75] Schools and Staffing Surveys, 1993-94. *Public School District Survey*. Tabulations conducted by the National Commission on Teaching for America's Future.

[76] The seven programs are at Alverno College in Milwaukee, Wisconsin; Bank Street College of Education in New York City; Trinity University in San Antonio, Texas; University of California at Berkeley; University of Southern Maine; University of Virginia in Charlottesville; and Wheelock College in Boston, Massachusetts. The outcome evidence collected included reputational evidence about quality from scholars

and from practitioners who hire program graduates; surveys and interviews of graduates about their perceptions of their preparation in comparison with a comparison group drawn randomly from beginning teachers across the country; surveys and interviews of principals about their perceptions of the graduates' preparation and performance; and observations of graduates' practice in their classrooms.

[77] OECD, *Education at a Glance, 1995* and the National Commission on Teaching for America's Future, *What Matters Most*.

[78] Richard Howard, Randy Hitz, and Larry Baker. *Comparative Study of Expenditures per Student Credit Hour of Education Programs to Programs of other Disciplines and Professions*. Montana State University-Bozeman, Fall, 1997; see also, H. Ebmeier, S. Twombly, and D.J. Teeter, "The Comparability and Adequacy of Financial Support for Schools of Education," *Journal of Teacher Education* (1991), pp. 226-235.

[79] NCES, *America's Teachers*, p. 31.

[80] Schools and Staffing Surveys, 1993-94, *Public School Teacher Questionnaire*. Tabulations by the National Commission on Teaching and America's Future.

[81] NCES, *Schools and Staffing in the U.S.: A Statistical Profile, 1993-94*. Washington, D.C.: U.S. Department of Education, p.8.

[82] NCES, *America's Teachers*, p. 38.

[83] Schools and Staffing Surveys, 1993-94. *Public School Teacher Questionnaire*. Tabulations by the National Commission on Teaching and America's Future.

[84] Schools and Staffing Surveys, 1993-94. *Public School Teacher Questionnaire*. State-by-state tabulations conducted by the National Commission on Teaching and America's Future.

[85] NEA, *Status*, pp. 248-252.

[86] NEA, *Status*, p. 268.

[87] NCES, *America's Teachers*.

[88] National Education Association, *Status* p. 89.

[89] NCES, *America's Teachers*, p. 59.

[90] U.S Congress, Office of Technology Assessment, *Teachers and Technology: Making the Connection*, OTA-HR-616. Washington, D.C.: U.S. Government Printing Office, 1995..

[91] The Lighthouse Partnerships for Teacher Preparation and Recruiting New Teachers for Underserved Areas/Minority Recruitment Act (S.1209) would replace the current Title V.

[92] Ohio SB 230, adopted October 1996; Am. Sub. HB 215, adopted June 1997; Am. Sub. SB 55, adopted August 1997.

[93] Information compiled by the National Conference of State Legislatures, as of June 13, 1997.

Appendix A: State-by-State Report Card, Indicators of Attention to Teaching Quality, October 1997

State		Total Quality Indicators (out of 12)	Investments in Teacher Quality				
			Unqualified New Hires[1]		Well-Qualified Teachers[1]	Out-of-Field Teaching[1]	Teachers as a % of Total Staff[2]
			All new hires	New entrants only	(Average % of teachers in core academic fields with full certification and a major in their field)	(% of math teachers without at least a minor in math)	(-/+ % from previous year)
			(% of new hires who are unlicensed in their main field)				
			(* @ 2% or less in either category)		(* @ 80% or higher)	(* @ 20% or less)	(* @ 60% or higher)
Alabama	**	2	7%	5%	71%	25%	52.9% +
Alaska	*	1	5%	4%	52%	56%	49.1% +
Arizona		0	4%	4%	68%	25%	50.1% –
Arkansas	****	4	9%	19%	74%	30%	53.8% +
California	****	4	8%	12%	65%	46%	52.0% +
Colorado	****	4	3%	2% *	74%	26%	52.5% –
Connecticut	***	3	4%	0%† *	78%	23%	54.5% =
Delaware	*	1	12%	—	—	—	54.5% –
District of Columbia	***	3	17%	—	—	—	56.4% –
Florida	*	1	13%	16%	66%	30%	48.3% –
Georgia	***	3	4%	3%	76%	23%	48.2% –
Hawaii	***	3	23%	23%	64%	—	62.3% + *
Idaho	**	2	5%	4%	73%	34%	58.6% –
Illinois	*	1	7%	6%	73%	22%	54.3% +
Indiana	****	4	2%	1%† *	76%	25%	48.0% –
Iowa	******	6	2%	4% *	82% *	14% *	52.1% –
Kansas	*	1	3%	1% *	75%	22%	53.7% –
Kentucky	*****	5	7%	3%	71%	28%	46.3% –
Louisiana	*	1	23%	31%	64%	33%	50.5% +
Maine	**	2	4%	0% *	73%	29%	52.3% –
Maryland	**	2	13%	26%	70%	31%	54.4% –
Massachusetts	*	1	12%	15%	78%	29%	55.4% –
Michigan	****	4	3%	0% *	73%	28%	46.9% –
Minnesota	*******	7	5%	8%†	82% *	14% *	62.7% = *
Mississippi	***	3	4%	5%	77%	18% *	47.6% +
Missouri	**	2	5%	1% *	77%	09% *	48.0% –
Montana	***	3	3%	0% *	84% *	20% *	54.2% –
Nebraska	***	3	4%	0%† *	75%	26%	52.9% –
Nevada	**	2	5%	4%†	—	—	58.5% +
New Hampshire	**	2	17%	21%†	85% *	26%	53.3% –
New Jersey	**	2	2%	3%† *	68%	30%	53.2% +
New Mexico	*	1	8%	5%	68%	40%	48.7% –
New York	*	1	13%	23%	73%	26%	51.0% –
North Carolina	******	6	8%	9%	70%	23%	52.2% +
North Dakota	****	4	2%	0% *	83% *	18% *	54.3% –
Ohio	*****	5	2%	3% *	76%	25%	55.2% +
Oklahoma	****	4	1%	1% *	74%	31%	47.0% –
Oregon	***	3	7%	3%†	69%	36%	51.8% –
Pennsylvania	****	4	0%	0%† *	73%	17% *	53.0% –
Rhode Island	***	3	3%	—	—	—	63.5% – *
South Carolina	**	2	13%	11%	73%	19% *	53.3% +
South Dakota	**	2	4%	1% *	74%	25%	53.2% –
Tennessee	***	3	1%	0% *	69%	27%	54.0% +
Texas	*	1	13%	20%	70%	30%	52.0% =
Utah		0	7%	12%	70%	26%	53.6% –
Vermont	***	3	0%	— *	—	—	49.1% –
Virginia	*	1	12%	13%	77%	32%	54.4% –
Washington	***	3	2%	2% *	65%	51%	51.4% +
West Virginia	**	2	2%	— *	66%	39%	54.5% –
Wisconsin	****	4	1%	0% *	84% *	16% *	57.9% +
Wyoming	****	4	1%	1% *	76%	25%	51.2% –
US Average/Total			**8%**	**11%**	**72%**	**28%**	**52%** –

— Too few cases for reliable estimate
† Interpret with caution due to small sample size

Attention to Teacher Education & Development

Professional Accreditation[3]	Student Teaching		New Teacher Induction[8]	Professional Development[9]
% of teacher education programs in NCATE system)	# of required weeks[4]	Experience with diverse learners[7]	State-required and funded, with mentor training	(% of teachers who received > 8 hours of professional development)
(* @ 80% or more)	(* @ ≥ 12 weeks)	(* with yes)	(* with yes)	(* with 60% or more)
60%	12 *	no	no	39%
0%	12 *	no	pending	55%
0%	6-8 *	no	no	44%
100% *	12 *	yes *	no	43%
19%	15 *	yes *	partial	58%
44%	—	yes *	partial	53%
20%	10	no	yes *	46%
75%	9	no	no	46%
71%	9	yes *	yes *	61% *
44%	12 *	no	partial	52%
65%	10	yes *	partial	47%
0%	9	no	no	63% *
83% *	10*	no	yes *	55%
31%	8	yes *	pending	36%
89% *	10	no	yes *	33%
16%	12 *	no	no	48%
59%	10	no	pending	42%
42%	12 *	no	yes *	72% *
74%	6-8*	yes *	partial	39%
33%	15 *	no	no	52%
27%	12 *	no	no	42%
12%	5-6*	yes *	no	47%
48%	8*	yes *	partial	40%
77%	10-12*	yes *	piloting	50%
67%	—	no	no	40%
50%	—	no	partial	33%
63%	10*	no	no	54%
81% *	14 *	no	no	43%
100% *	8	no	no	50%
23%	—	yes *	no	59%
32%	16 *	no	partial	37%
63%	6-8*	no	partial	34%
4%	—	no	piloting	43%
100% *	10	yes *	yes *	58%
60%	10	no	piloting	45%
40%	10	yes *	yes *	38%
71%	12 *	no	partial	33%
19%	15 *	yes *	pending	49%
18%	12 *	no	yes *	37%
25%	12* *	yes *	no	37%
43%	12 *	no	pending	38%
58%	10	yes *	no	48%
43%	15 *	yes *	no	41%
15%	10	no	no	58%
50%	10-12*	no	no	51%
8%	12 *	no	no	62% *
43%	10	no	no	45%
55%	8	yes *	partial	60% *
79%	—	no	yes *	46%
33%	18 *	no	no	48%
100% *	—	yes *	no	50%
40%	**(19)**	**(19)**	**(9)**	**46%**

Attention to Teaching Standards

Professional Standards Board[10]	Nationally Certified Teachers[11]	Incentives for National Board Certification[12]		
		Link to Licensing	Support for Professional Development	Financial Rewards
(* with yes)	(* with 20 or more)	(* with at least two types of incentives)		
no	17	yes	yes	no *
no	5	yes	no	no
no	2	yes	no	no
no	0	yes	yes	no *
yes *	69 *	no	no	no
no	23 *	yes	no	no
no	22 *	no	no	no
no	10	no	yes	yes *
no	2	no	no	no
no	17	no	no	no
yes *	19	yes	yes	yes *
yes *	0	no	no	no
no	1	no	no	no
no	15	no	yes	no
yes *	13	no	no	no
yes *	14	yes	yes	no *
no	9	no	no	no
yes[1] *	8	yes	no	yes *
no	5	no	no	no
no	6	no	no	no
no	0	yes	yes	no *
no	7	no	yes	no
no	56 *	yes	yes	no *
yes *	61 *	yes	yes	no *
no	26 *	no	yes	yes *
no	1	no	no	no
no	0	yes	no	no
no	2	no	no	no
yes[1] *	0	no	no	no
no	1	no	no	no
no	13	no	no	no
no	54 *	yes	no	no
no	33 *	no	no	no
yes[1] *	208 *	yes	yes	yes *
yes *	0	no	no	no
no	146 *	yes	yes	yes *
yes *	0	yes	yes	yes *
yes *	0	no	no	no
no	3	no	no	no
no	2	yes	no	no
no	8	no	no	yes
no	0	no	no	no
no	1	no	no	no
yes[1] *	6	no	no	no
no	1	no	no	no
no	1	no	no	no
no	15	yes	yes	no *
no	10	no	no	no
no[2]	1	no	no	no
no	1	no	no	no
yes *	0	no	no	no
(14)	**(911)**	**(17)**	**(15)**	**(8)**

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Appendix A: State-by-State Report Card Notes

1. **Unqualified Hires**
Percentage of newly hired teachers not licensed in their main assignment field. "All new hires" includes teachers who changed jobs (movers and transfers). "New entrants" are new hires who did not teach during the previous year and are usually newly licensed. (Source: U.S. Department of Education, National Center for Education Statistics, *1993-94 Schools and Staffing Surveys*, Tabulations conducted by the National Commission on Teaching & America's Future.)

2. **Well-Qualified Teachers**
The average percentage of public high school teachers (grades 9-12) teaching English, mathematics, science, or social studies who hold full state certification and a college major in the field they teach. (Source: U.S. Department of Education, National Center for Education Statistics, *1993-94 Schools and Staffing Surveys*, Tabulations conducted by the National Commission on Teaching & America's Future.)

3. **Out-of-Field Teaching – % of Math Teachers Without At Least a Minor**
The percentage of public high school teachers (grades 9-12) who taught one or more classes in mathematics without at least a minor in the field. (Source: U.S. Department of Education, National Center for Education Statistics, *1993-94 Schools and Staffing Survey*, Tabulations conducted by the National Commission on Teaching & America's Future.)

4. **Teachers as a Percent of Total Staff**
Percentage of all school staff who are teachers, Fall 1995. (Source: U.S. Department of Education, National Center for Education Statistics, *Statistics in Brief—Public School Student, Staff, and Graduate Counts by State, School Year Fall 1995*, May 1997.)

5. **Professional Accreditation**
The percentage of teacher education institutions that are in the National Council for the Accreditation of Teacher Education (NCATE) system of professional accreditation. Data derived from the National Association of State Directors of Teacher Education and Certification: *Manual on Certification and Preparation of Educational Personnel in the United States and Canada, 1997-98* and state education department officials. (Source: National Council for the Accreditation of Teacher Education, September 1997.)

6. **Number of Required Weeks of Student Teaching**
Number of weeks of full-time student teaching required by the state. An (e) indicates an estimate based on required clock or college credit hours. May vary by grade level. (Source: National Association of State Directors of Teacher Education and Certification: *Manual on Certification and Preparation of Educational Personnel in the United States and Canada, 1997-98* and state education department officials).

7. **Student Teaching Experience Includes Teaching Special Needs Students in Diverse Settings**
Whether or not a state requires that the student teaching experience includes work with diverse learners who are either special/exceptional students or in a multicultural setting. (Source: National Association of State Directors of Teacher Education and Certification, *Manual on Certification and Preparation of Educational Personnel in the United States and Canada, 1997-98*.)

8. **New Teacher Induction**
Indicates whether or not a state requires that all new teachers participate in a formal induction or mentoring program that is state-funded and provides state or district training for mentors. States that provide or require such services only for some beginning teachers or that do not fund and train mentors are listed as having "partial" programs. (Developed from state-by-state survey of new teacher policies and practices conducted by *Education Week* and the National Commission for Teaching & America's Future, September 1997.)

9. **Professional Development**
The percentage of public school teachers who received at least 9 hours of professional development in any of the following areas in 1993-94: subject matter, teaching methods, student assessment, cooperative learning, or use of technology. (Source: U.S. Department of Education, National Center for Education Statistics, *1993-94 Schools and Staffing Surveys*, Tabulations conducted by the National Commission on Teaching & America's Future.)

10. **Professional Standards Boards**
Whether or not a state has established an independent professional teacher standards board to set standards for teacher education and licensing. An independent standards board has the authority to manage its own budget, set and enforce standards, and hire and direct its own staff. (1) A board that sets standards and has its own staff but does not have complete management or enforcement authority is semi-autonomous; (2) A board that was enacted but not implemented. (Source: National Education Association, *Teacher Licensure: Characteristics of Independent State Teacher Professional Standards Boards*, 1997.)

11. **Nationally Certified Teachers**
Number of teachers certified by the National Board for Professional Teaching Standards. (Source: National Board for Professional Teaching Standards, October 1997.)

12. **Incentives for NBPTS Certification**
Whether or not state policy has been established to: (1) link National Board Certification to licensing (e.g., portability, license renewal, or advanced certification status); (2) support participation in National Board assessments as a form of professional development; and (3) financially reward National Board-Certified teachers with increased compensation. (Source: National Board for Professional Teaching Standards, October 1997).

Appendix B
Table 1 - Teacher Qualifications: Education and State Certification

	Percentage of teachers with master's degree or higher	Percentage of teachers by type of state certification in their main field								
		No Certification			Less than full[1]			Full[2]		
		All Teachers	Newly Hired Teachers		All Teachers	Newly Hired Teachers		All Teachers	Newly Hired Teachers	
			(including transfers)	(excluding transfers)		(including transfers)	(excluding transfers)		(including transfers)	(excluding transfers)
U.S. Average	47.3	3.6	7.7	10.7	4.8	12.5	16.3	91.7	79.9	73.0
Alabama	60.9	3.2	7.2	5.3	1.4	2.5	4.8	95.6	90.3	89.9
Alaska	39.7	6.1	4.7	3.8	1.5	5.0	8.6	92.4	90.4	87.6
Arizona	48.1	2.2	3.6	3.9	9.1	16.8	20.5	88.8	79.7	75.6
Arkansas	34.8	2.7	9.3	18.7	1.7	2.0	3.4	95.8	88.8	77.9
California	40.5	5.0	8.0	11.6	7.7	17.6	25.0	87.4	74.4	63.4
Colorado	52.4	5.3	2.5	2.2	2.9	11.6	14.3	91.7	85.8	83.5
Connecticut	79.5	1.7	4.4	0.0 *	10.9	19.6	27.9 *	87.5	76.0	72.1 *
Delaware	53.6	4.8	11.5	—	5.1	20.6	—	90.2	68.0	—
District of Columbia	59.6	7.8	16.5	—	4.8	15.8	—	87.5	67.7	—
Florida	41.7	3.5	12.7	16.0	4.8	24.1	26.2	91.7	63.3	57.8
Georgia	50.2	3.2	4.2	3.1	3.7	15.9	11.3	93.1	79.9	85.7
Hawaii	50.4	11.8	22.5	23.4	3.1	6.5	2.1	85.0	71.1	74.4
Idaho	24.7	2.7	5.4	4.0	1.3	4.0	9.8	96.1	90.6	86.3
Illinois	49.9	4.8	6.5	5.5	2.3	6.9	5.5	93.0	86.6	88.9
Indiana	77.8	2.0	2.1	0.9 *	2.2	4.6	5.8 *	95.9	93.4	93.3 *
Iowa	32.6	3.4	2.1	3.7	5.7	30.5	45.8	91.0	67.4	50.5
Kansas	46.1	0.9	2.9	1.4	0.7	3.8	8.8	98.5	93.4	89.9
Kentucky	76.4	3.9	7.4	3.0	7.6	23.5	36.2	88.6	69.2	60.8
Louisiana	38.6	7.4	22.8	31.4	3.6	7.9	14.8	89.0	69.5	53.8
Maine	30.2	4.0	4.2	0.0 *	4.5	29.5	33.5 *	91.5	66.3	66.6 *
Maryland	56.0	4.6	12.8	25.7	2.9	5.8	7.3	92.6	81.4	67.0
Massachusetts	59.6	5.7	11.9	15.4	1.3	1.8	2.3	93.0	85.8	82.4
Michigan	53.7	0.7	3.2	0.0	10.4	16.9	40.4	88.9	79.9	59.6
Minnesota	36.7	2.0	5.1	7.8 *	1.4	5.5	12.8 *	96.7	89.4	79.5 *
Mississippi	42.0	3.3	4.1	5.1	3.7	12.5	17.4	92.9	83.4	77.5
Missouri	45.4	2.0	4.6	1.4	3.6	11.9	21.4	94.4	83.6	77.1
Montana	28.3	1.5	2.8	0.0	2.1	5.4	6.5	96.4	91.8	93.5
Nebraska	38.3	1.5	4.2	0.0 *	1.3	8.0	16.1 *	97.3	87.8	83.9 *
Nevada	49.2	1.8	4.5	3.5 *	3.3	8.4	12.5 *	94.8	87.1	84.0 *
New Hampshire	39.3	4.4	17.0	20.7 *	4.8	8.7	4.5 *	90.8	74.3	74.8 *
New Jersey	43.5	2.7	1.7	3.4 *	1.4	8.8	5.3 *	95.8	89.4	91.3 *
New Mexico	46.3	3.7	8.4	5.1	2.0	6.9	12.6	94.2	84.8	82.3
New York	74.9	6.8	13.0	23.3	9.2	31.2	31.3	84.0	55.9	45.4
North Carolina	36.4	3.6	7.7	9.2	3.4	13.0	22.3	93.1	79.3	68.5
North Dakota	19.7	1.0	2.4	0.0	2.1	8.1	8.8	97.0	89.6	91.2
Ohio	45.5	1.9	2.2	3.3	9.6	22.5	17.6	88.5	75.4	79.1
Oklahoma	43.0	1.1	0.7	0.6	2.9	10.2	13.1	96.2	89.2	86.3
Oregon	47.9	3.1	6.5	3.0 *	2.5	7.6	8.5 *	94.4	86.0	88.6 *
Pennsylvania	52.8	1.4	0.0	0.0 *	4.3	9.3	15.7 *	94.4	90.6	84.3 *
Rhode Island	60.0	0.3	2.6	—	4.5	8.0	—	95.3	89.4	—
South Carolina	50.0	5.0	12.9	10.7	1.7	1.9	3.9	93.3	85.3	85.4
South Dakota	24.7	1.4	3.9	1.4	1.5	6.7	13.8	97.1	89.4	84.8
Tennessee	48.0	2.1	1.1	0.0	1.8	5.2	6	96.3	93.8	99.4
Texas	29.5	4.1	12.7	19.9	6.9	11.2	13.6	89.0	76.2	66.4
Utah	28.2	3.0	7.3	11.7	2.2	4.8	7.4	94.9	87.9	80.8
Vermont	49.6	1.2	0.0	—	0.6	0.0	—	98.2	100.0	—
Virginia	34.2	4.3	11.7	13.2	2.4	7.7	15.5	93.3	80.7	71.4
Washington	42.1	3.2	2.4	1.6	1.5	1.9	4.1	95.5	95.8	94.3
West Virginia	57.5	1.6	2.1	—	4.2	8.2	—	94.4	89.8	—
Wisconsin	40.5	2.5	0.7	0.0	1.7	7.3	7.5	95.8	92.0	92.5
Wyoming	28.3	1.3	0.6	1.4	0.3	1.0	2.5	98.5	98.4	96.1

— Too few cases for reliable estimate

* Interpret with caution due to small sample size

1 Less-than-full certification includes emergency, temporary, alternative, and provisional licenses that require additional coursework or represent a lower standard than a regular certificate.

2 Full certification includes regular and advanced licenses and probationary licenses granted to beginning teachers who have completed all requirements except a probationary period.

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Surveys. Tabulations conducted by the National Commission on Teaching & America's Future.

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Table 2 – Teacher Qualifications: In-Field Preparation

Percentage of Public High School Teachers (grades 9-12) with Full-State Certification and a Major in the Field They Teach, by Field

	Math	Science	Social Studies	English	Foreign Lang.	Vocational Ed.	Art/ Music	Physical Ed.	Life Science[1]	Physical Science[1]
U.S. Average	67.3	75.7	72.8	72.7	79.7	74.3	72.4	78.0	59.6	34.8
Alabama	73.6	72.8	67.4	70.7	71.6	82.4	78.8	71.2	42.3	29.0
Alaska	39.1	61.7	57.4	51.5	—	68.4	40.5	36.1	—	17.8
Arizona	65.8	71.2	70.3	63.7	—	71.3	73.8	72.8	—	—
Arkansas	63.4	85.5	79.4	68.9	—	84.8	81.3	83.7	65.0	25.0
California	49.0	71.0	71.1	66.9	63.6	68.7	53.2	66.3	60.8	40.0
Colorado	65.2	84.1	69.1	79.3	73.8	54.4	74.5	68.0	63.4	44.8
Connecticut	73.2	83.6	77.6	76.4	80.6	70.1	73.3	—	—	66.9
Delaware	—	—	—	—	—	—	—	—	—	—
District of Columbia	—	—	—	—	—	—	—	—	—	—
Florida	67.3	69.4	65.4	61.6	—	65.0	90.9	88.9	62.6	38.8
Georgia	70.9	78.4	82.5	73.1	77.2	73.2	64.1	88.2	67.4	14.4
Hawaii	—	—	—	—	—	—	—	—	—	—
Idaho	65.6	76.7	67.4	83.0	63.3	87.0	78.8	79.2	52.2	22.9
Illinois	76.2	70.6	70.3	73.0	—	77.4	74.4	93.9	61.0	—
Indiana	74.2	80.6	71.1	79 6	89.5	84.1	84.6	85.1	—	47.0
Iowa	81.0	85.0	82.2	80.6	89.6	83.8	80.3	68.0	—	57.6
Kansas	72.2	81.8	68.2	79.2	—	87.5	85.8	79.4	60.1	40.6
Kentucky	64.5	72.4	74.3	70.7	—	71.1	81.5	—	—	32.8
Louisiana	59.7	60.8	60.5	72.9	—	87.4	73.6	85.3	39.5	21.8
Maine	68.6	75.6	75.0	72.2	—	75.8	65.1	—	—	23.6
Maryland	63.4	77.3	73.5	66.2	—	73.3	79.0	—	58.1	—
Massachusetts	69.4	83.6	74.7	83.3	91.3	59.0	58.7	89.1	66.1	51.0
Michigan	68.1	74.6	73.6	76.9	—	73.5	78.3	82.0	61.8	35.7
Minnesota	82.0	89.0	80.6	75.1	85.2	83.5	77.8	88.2	—	29.6
Mississippi	75.9	73.7	84.9	72.0	—	69.8	77.6	50.1	51.4	18.8
Missouri	83.6	72.6	73.6	76.3	75.1	80.2	70.3	78.5	—	42.3
Montana	80.5	85.6	88.1	80.7	72.6	87.1	78.4	78.2	53.6	31.5
Nebraska	72.5	80.1	73.5	73.9	—	87.5	89.1	63.7	—	30.2
Nevada	—	—	—	—	—	—	—	—	—	—
New Hampshire	67.8	—	—	77.9	—	—	—	—	—	—
New Jersey	67.7	67.1	71.0	67.5	87.2	65.9	76.6	78.3	—	21.3
New Mexico	56.8	79.0	66.6	70.3	—	70.1	71.1	69.0	—	—
New York	64.9	73.2	78.7	74.9	86.5	75.2	78.1	88.1	56.2	41.8
North Carolina	73.7	71.9	63.0	71.1	—	69.7	73.2	80.2	59.7	26.1
North Dakota	78.3	86.6	82.1	82.9	80.1	85.0	91.2	66.9	53.6	21.7
Ohio	68.0	82.9	71.4	79.9	88.1	72.4	65.6	71.5	—	36.3
Oklahoma	66.3	76.6	77.4	75.6	58.3	89.7	75.0	69.2	51.9	23.1
Oregon	63.2	81.8	69.4	63.3	59.2	75.6	55.8	78.9	63.9	35.2
Pennsylvania	78.6	78.2	68.5	64.6	87.0	75.9	80.2	84.7	—	36.7
Rhode Island	—	—	—	—	—	—	—	—	—	—
South Carolina	76.7	65.6	71.4	80.0	—	57.6	—	—	—	—
South Dakota	73.7	81.9	68.0	73.8	74.0	87.9	91.2	73.9	56.1	34.3
Tennessee	71.8	70.7	68.8	64.9	91.0	67.8	63.1	78.8	55.2	20.1
Texas	61.8	72.0	73.8	73.2	79.5	67.9	62.9	67.7	65.8	23.4
Utah	72.3	70.4	63.9	72.7	76.5	77.0	71.7	64.4	54.1	29.4
Vermont	—	—	—	—	—	—	—	—	—	—
Virginia	62.9	88.8	73.5	83.9	—	72.5	—	—	—	—
Washington	48.2	79.7	65.4	66.2	74.2	68.2	57.1	64.4	54.6	22.6
West Virginia	59.2	70.2	70.4	65.7	—	73.2	74.6	87.2	61.4	—
Wisconsin	83.8	83.4	82.5	87.0	79.2	90.4	85.1	89.4	61.4	58.8
Wyoming	73.7	82.0	75.6	73.7	—	86.1	65.6	83.8	—	—

— Too few cases for reliable estimate.
[1] These estimates represent the proportion of teachers without a state certificate and a major in the particular subfields of life, science or physical science.

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School Teacher Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

Table 3 – Teacher Qualifications: Out-of-Field Teaching

Percentage of Public High School Teachers (grades 9-12) with Less Than a Minor in the Field They Teach, by Field

	Math	Science	Social Studies	English	Foreign Lang.	Vocational Ed.	Art/ Music	Physical Ed.	Life Science[1]	Physical Science[1]	History[1]
U.S. Average	28.1	18.2	17.8	21.5	13.7	18.0	20.4	14.6	31.2	54.7	51.8
Alabama	25.0	22.7	24.1	24.4	18.9	9.1	15.4	20.3	55.6	67.9	55.9
Alaska	55.7	32.3	28.4	38.6	—	29.5	48.7	60.0	—	71.8	58.4
Arizona	24.9	14.6	22.2	25.2	—	21.2	15.6	17.0	—	—	44.6
Arkansas	30.0	9.9	16.7	27.0	—	12.4	11.6	10.5	30.9	58.8	67.2
California	46.4	22.6	13.3	24.8	26.9	19.1	37.8	25.4	30.7	52.0	46.9
Colorado	26.3	12.7	23.6	15.0	16.1	35.6	17.6	21.6	24.2	48.1	51.8
Connecticut	23.3	11.7	13.6	20.2	3.6	22.6	16.0	—	—	27.9	35.0
Delaware	—	—	—	—	—	—	—	—	—	—	—
District of Columbia	—	—	—	—	—	—	—	—	—	27.2	—
Florida	29.9	27.2	19.9	35.6	—	24.6	9.1	2.5	35.1	52.4	67.6
Georgia	23.0	18.3	14.2	22.4	16.6	22.2	18.1	11.8	26.6	66.4	49.2
Hawaii	—	—	—	—	—	—	—	—	—	—	—
Idaho	34.4	20.0	26.9	13.2	30.3	11.5	17.2	11.5	38.7	65.1	58.1
Illinois	22.1	22.1	26.2	18.0	—	13.1	21.9	4.4	39.0	—	47.1
Indiana	24.5	14.5	20.2	15.8	8.0	11.9	8.0	7.9	—	37.0	59.1
Iowa	14.0	13.4	16.6	16.1	6.6	9.6	9.8	26.0	—	35.4	62.4
Kansas	22.1	17.0	23.9	20.8	—	9.9	10.1	16.5	31.3	54.1	59.6
Kentucky	28.3	15.9	17.0	27.2	—	21.7	18.5	—	—	40.1	30.9
Louisiana	33.0	30.4	25.6	15.2	—	7.8	19.7	2.2	49.0	66.2	65.7
Maine	29.4	20.5	14.9	22.3	—	19.8	28.4	—	—	58.5	51.9
Maryland	31.0	17.1	18.0	31.7	—	19.6	11.4	—	33.7	—	41.3
Massachusetts	29.2	13.5	15.6	14.5	7.6	35.2	37.3	10.9	27.6	48.0	45.6
Michigan	28.0	10.5	9.1	14.4	—	14.6	8.9	13.9	19.9	47.5	43.9
Minnesota	14.3	9.3	7.8	23.6	9.9	7.5	16.0	6.7	—	52.9	49.3
Mississippi	18.3	20.9	9.8	23.3	—	21.9	13.3	31.1	38.8	72.2	56.3
Missouri	9.3	21.2	19.3	16.5	18.5	14.3	23.2	21.5	—	43.4	66.7
Montana	19.5	11.9	8.2	15.6	21.0	5.5	15.3	5.9	28.7	61.8	53.3
Nebraska	26.3	17.0	17.8	24.3	—	10.8	9.0	23.0	—	54.8	68.9
Nevada	—	—	—	—	—	—	—	—	—	—	—
New Hampshire	25.9	—	—	13.5	—	—	—	—	—	—	—
New Jersey	29.8	27.5	19.5	27.8	10.2	23.1	23.4	18.0	—	77.2	53.1
New Mexico	39.9	21.0	24.6	23.0	—	28.0	28.9	22.7	—	—	59.5
New York	25.6	14.5	14.0	19.5	10.5	15.1	12.5	2.5	22.3	50.6	51.5
North Carolina	23.2	22.9	24.6	24.5	—	28.5	23.3	17.6	37.6	66.3	55.9
North Dakota	17.8	6.0	12.7	14.9	15.6	11.4	6.7	24.7	26.6	67.8	57.4
Ohio	25.2	14.0	17.7	18.3	7.4	16.7	19.4	11.1	—	56.6	62.8
Oklahoma	31.1	16.1	16.2	18.0	30.3	3.9	16.6	18.4	41.7	61.7	52.7
Oregon	35.9	13.2	19.5	30.6	22.7	19.5	31.2	17.6	30.9	46.3	46.9
Pennsylvania	17.2	17.0	21.1	29.7	5.0	12.6	11.4	9.7	38.1	53.9	65.0
Rhode Island	—	—	—	—	—	—	—	—	—	—	—
South Carolina	18.8	23.1	23.7	15.7	—	35.3	—	—	—	—	53.9
South Dakota	24.8	15.4	23.8	22.7	21.0	7.2	8.8	20.3	33.3	55.2	65.9
Tennessee	27.0	27.6	17.0	27.9	9.0	25.3	35.5	13.5	41.9	64.5	46.9
Texas	29.8	21.7	17.4	17.8	11.0	22.3	27.9	18.6	23.5	67.2	37.3
Utah	26.3	22.7	14.0	21.1	6.5	13.5	25.5	23.8	40.2	51.7	36.1
Vermont	—	—	—	—	—	—	—	—	—	—	—
Virginia	32.3	8.7	17.1	14.4	—	22.4	—	—	—	—	—
Washington	50.8	13.2	24.2	23.0	19.4	20.5	36.1	28.1	29.2	67.0	47.4
West Virginia	39.3	26.1	19.7	29.4	—	16.8	22.2	12.8	33.0	—	84.2
Wisconsin	16.2	16.6	14.4	10.8	17.9	9.4	12.2	10.6	29.2	32.8	35.9
Wyoming	24.9	16.1	16.8	19.9	—	12.7	25.6	10.3	—	—	—

— Too few cases for reliable estimate

[1] These estimates represent the proportion of teachers without a major or a minor in the particular subfields of life science, physical science, or history.

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School Teacher Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

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Table 4 – District Hiring Requirements

Percentage of Public School Districts Requiring Selected Credentials When Screening Teacher Applicants

	Full Standard State Certification for Field	Graduation from State-Approved Teacher Education Program	College Major or Minor in the Field to be Taught
U.S. Average	83.3	71.9	66.9
Alabama	86.9	89.8	88.2
Alaska	66.4	71.0	22.1
Arizona	85.3	59.3	64.9
Arkansas	63.5	84.7	62.8
California	78.0	63.0	44.7
Colorado	77.2	55.7	69.7
Connecticut	95.2	72.0	56.8
Delaware	52.9	52.9	70.6
District of Columbia	100.0	0.0	100.0
Florida	58.0	36.3	27.1
Georgia	46.0	42.3	46.8
Hawaii	100.0	100.0	0.0
Idaho	88.7	75.1	62.4
Illinois	88.3	72.4	69.2
Indiana	88.2	80.5	80.6
Iowa	77.5	75.5	64.6
Kansas	89.7	80.6	75.4
Kentucky	93.5	95.2	92.6
Louisiana	78.7	78.2	60.0
Maine	87.6	59.2	67.2
Maryland	64.5	37.7	57.6
Massachusetts	89.9	41.5	59.7
Michigan	94.6	89.8	90.0
Minnesota	92.3	80.8	90.4
Mississippi	91.2	76.3	70.3
Missouri	64.6	86.9	68.7
Montana	85.7	73.8	77.7
Nebraska	89.3	83.7	69.0
Nevada	72.2	66.7	72.2
New Hampshire	85.0	55.4	70.7
New Jersey	88.4	37.4	44.0
New Mexico	74.8	85.4	70.9
New York	95.4	61.8	66.1
North Carolina	64.3	58.1	67.4
North Dakota	95.7	81.7	96.3
Ohio	97.0	84.9	78.1
Oklahoma	69.8	76.9	73.6
Oregon	72.7	74.1	39.3
Pennsylvania	97.6	73.6	81.7
Rhode Island	100.0	67.6	70.3
South Carolina	84.4	80.6	51.3
South Dakota	89.2	80.5	70.2
Tennessee	93.2	77.2	47.6
Texas	63.4	75.9	54.3
Utah	74.2	72.6	58.8
Vermont	98.3	55.3	63.7
Virginia	71.3	40.3	52.1
Washington	80.9	75.4	51.4
West Virginia	81.3	87.1	68.5
Wisconsin	84.6	80.0	90.0
Wyoming	85.7	57.8	69.0

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School District Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

Table 5 – Public School Teachers' Access to Professional Development

	Percentage of beginning teachers who experienced an induction program[1]	Percentage of teachers receiving different types of professional development by number of hours									
		Subject Matter		Teaching Methods		Technology		Student Assessment		Cooperative Learning	
		None	9+ hours	None	9+ hours	None	9+ hours	None	9+ hours	None	9+ hours
U.S. Average	55	70	15	36	28	51	15	49	11	49	13
Alabama	41	67	15	30	24	57	11	48	08	49	09
Alaska	20	64	20	36	33	37	21	51	11	58	11
Arizona	50	73	14	44	23	55	13	48	12	59	10
Arkansas	22	72	13	32	30	66	10	53	08	52	09
California	58	61	24	23	40	47	15	32	18	47	14
Colorado	45	67	19	42	30	45	20	43	19	61	11
Connecticut	76	61	18	28	27	52	15	38	11	48	10
Delaware	59	70	13	36	24	53	10	43	16	53	09
District of Columbia	65	62	24	32	29	42	28	48	15	31	26
Florida	90	70	12	33	28	37	20	54	13	47	19
Georgia	62	75	11	40	26	55	18	63	08	51	13
Hawaii	41	60	24	32	41	44	23	47	16	38	28
Idaho	68	71	18	39	35	60	15	60	15	57	18
Illinois	38	77	10	47	16	58	10	43	12	57	12
Indiana	84	78	11	44	16	48	13	61	07	54	07
Iowa	35	72	16	43	25	43	15	44	14	58	12
Kansas	35	71	14	37	18	42	15	46	12	52	07
Kentucky	88	63	17	25	41	25	28	13	38	27	19
Louisiana	31	71	12	32	25	59	11	53	09	49	11
Maine	70	71	20	43	32	63	14	52	15	49	14
Maryland	51	77	12	35	26	52	15	46	09	41	14
Massachusetts	14	69	17	39	28	59	15	56	11	47	15
Michigan	31	74	12	38	26	56	10	49	08	52	13
Minnesota	45	68	18	36	31	47	15	50	15	56	11
Mississippi	27	69	11	34	21	57	11	32	13	35	13
Missouri	83	76	11	44	18	55	10	57	07	56	08
Montana	18	72	18	40	31	44	18	56	12	54	14
Nebraska	32	76	11	44	18	45	14	53	11	59	12
Nevada	27	67	20	34	33	68	14	61	11	56	17
New Hampshire	27	54	25	29	40	51	14	48	16	42	18
New Jersey	40	73	12	35	20	51	11	51	10	50	12
New Mexico	51	76	11	45	17	56	10	56	08	48	10
New York	51	76	14	44	24	62	14	58	11	55	15
North Carolina	83	68	19	30	34	45	22	42	15	43	19
North Dakota	16	71	15	43	28	48	17	65	08	61	09
Ohio	55	71	14	40	24	61	8	55	10	52	12
Oklahoma	82	72	13	35	20	53	8	46	06	42	08
Oregon	36	70	17	37	28	54	15	45	13	62	12
Pennsylvania	81	76	11	44	20	58	10	51	10	50	13
Rhode Island	03	78	11	43	23	64	11	53	09	51	10
South Carolina	50	74	11	39	24	58	11	55	08	46	12
South Dakota	25	73	12	45	24	38	21	56	11	53	11
Tennessee	46	75	10	34	23	45	18	50	07	51	08
Texas	62	60	20	25	37	38	18	43	12	34	17
Utah	75	65	19	33	32	41	19	58	10	49	12
Vermont	21	66	24	39	35	48	18	51	21	63	13
Virginia	58	71	14	38	27	50	14	53	10	47	12
Washington	50	64	24	38	35	36	28	50	16	54	15
West Virginia	45	71	14	34	29	51	17	46	10	43	13
Wisconsin	44	71	17	42	28	50	16	54	11	64	11
Wyoming	20	70	16	48	25	46	20	54	11	58	12

1 Percentage of teachers with 5 or fewer years of teaching experience who experienced a formal induction program.

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School Teachers Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

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Table 6 – Supply and Demand Indicators

Percentage of Schools Reporting Difficulty Filling Vacancies[1] in Selected Teaching Fields

		Secondary Schools[3]					
	Elementary[2]	Math	Physical Science	Biology	English	Special Education[4]	English as a Second Language
U.S. Average	3.0	16.9	16.1	12.4	9.8	18.3	5.8
Alabama	7.2	9.0	7.7	7.7	8.2	18.6	0.4
Alaska	2.6	10.0	9.5	6.6	4.9	13.9	6.3
Arizona	4.7	28.6	16.1	14.3	21.5	27.7	17.2
Arkansas	10.2	12.1	19.0	14.9	9.2	17.6	2.3
California	10.3	22.6	22.4	17.0	14.1	22.3	18.0
Colorado	6.7	11.6	12.7	13.7	8.0	21.3	8.8
Connecticut	7.4	4.3	10.7	5.5	6.1	10.3	3.4
Delaware	16.8	—	—	—	—	28.5	1.5
District of Columbia	36.6	—	—	—	—	10.1	1.5
Florida	5.7	17.5	14.6	19.7	7.9	37.0	7.1
Georgia	3.2	30.6	32.1	26.4	11.1	28.3	0.9
Hawaii	—	—	—	—	—	52.1	0.9
Idaho	5.7	21.6	8.8	12.0	12.1	19.6	10.5
Illinois	8.5	12.9	9.9	12.0	7.3	15.7	3.2
Indiana	0.0	5.9	3.6	4.7	10.2	6.5	1.0
Iowa	1.5	5.1	9.4	3.8	8.4	17.8	2.4
Kansas	1.3	15.6	14.3	13.6	13.9	8.1	1.9
Kentucky	0.5	16.8	13.2	11.9	11.5	20.7	0.3
Louisiana	20.2	20.1	19.8	16.4	17.4	29.4	3.6
Maine	3.3	14.4	18.6	14.0	1.6	14.9	2.2
Maryland	19.3	17.5	23.7	13.8	13.4	14.5	1.5
Massachusetts	4.8	18.4	20.6	15.2	2.6	14.3	7.9
Michigan	3.0	9.5	8.0	2.7	0.0	6.2	0.0
Minnesota	5.9	15.6	19.6	6.4	3.6	21.4	8.0
Mississippi	16.9	23.2	18.2	24.0	12.8	29.7	2.5
Missouri	1.2	19.9	15.1	16.9	14.5	25.1	1.2
Montana	1.9	9.9	7.8	10.5	12.6	10.6	1.0
Nebraska	6.4	13.9	11.6	8.9	2.0	8.1	2.4
Nevada	3.0	17.9	21.6	22.1	12.5	31.0	14.1
New Hampshire	1.8	18.1	20.7	6.1	18.0	28.6	7.4
New Jersey	5.5	15.0	19.6	12.5	7.5	13.2	3.7
New Mexico	13.0	32.1	21.1	14.0	6.6	37.3	19.0
New York	8.0	13.4	12.1	11.9	6.2	10.8	4.7
North Carolina	8.7	28.4	30.2	23.7	18.3	25.3	4.4
North Dakota	3.3	12.7	15.9	14.0	7.6	8.7	0.7
Ohio	4.1	11.2	18.3	4.5	6.7	11.7	1.9
Oklahoma	5.7	13.9	11.0	8.2	12.0	17.0	2.8
Oregon	3.0	17.7	16.5	9.2	11.1	7.6	2.3
Pennsylvania	4.7	3.5	28.4	15.5	1.9	13.1	2.3
Rhode Island	0.8	—	—	—	—	5.9	1.9
South Carolina	10.5	18.2	12.4	12.1	8.7	20.3	0.9
South Dakota	3.5	12.9	9.5	6.5	8.3	17.8	1.7
Tennessee	9.1	22.5	12.7	14.4	9.3	15.9	2.1
Texas	11.8	37.6	22.2	17.0	16.9	26.8	13.4
Utah	5.0	22.4	23.0	10.0	12.7	11.3	10.7
Vermont	6.6	—	—	—	—	17.5	5.0
Virginia	9.6	11.0	11.9	13.4	8.2	23.0	6.3
Washington	12.2	16.0	9.9	9.8	14.2	17.6	10.9
West Virginia	3.2	2.2	4.7	8.7	2.2	8.2	0.3
Wisconsin	0.2	14.1	14.4	5.9	7.8	18.0	1.0
Wyoming	0.0	15.9	10.5	5.3	10.2	18.2	5.1

— Too few cases for reliable estimate

1 Percentage of schools reporting that it was somewhat difficult, very difficult, or impossible to fill vacancies. **2** Percentage of schools serving students in grades K-6 reporting difficulty filling elementary teacher vacancies. **3** Percentage of schools serving students in grades 7-12 reporting difficulty filling vacancies in selected fields. **4** Percentage of schools serving students in grades K-12 reporting difficulty filling vacancies in special education and in bilingual education / English as a Second Language.

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School Teacher and School Questionnaires). Tabulations conducted by the National Commission on Teaching & America's Future.

Table 7 – Supply and Demand Indicators: Incentives in Shortage Fields

Percentage of Public School Districts Offering Financial Incentives or Free Retraining in Shortage Fields, by Field

	Mathematics	Physical Science	Life Science	Special Education	English as a Second Language
U.S. Average	14	11	11	17	12
Alabama	11	11	13	11	3
Alaska	19	13	17	25	12
Arizona	14	9	10	19	22
Arkansas	11	10	10	16	8
California	17	15	14	20	39
Colorado	2	0	0	4	6
Connecticut	2	0	0	5	0
Delaware	29	35	29	24	24
District of Columbia	0	0	0	100	0
Florida	23	23	23	56	54
Georgia	37	33	33	54	18
Hawaii	100	100	100	100	0
Idaho	19	17	16	14	9
Illinois	9	7	8	11	6
Indiana	7	8	6	5	3
Iowa	13	13	13	16	5
Kansas	10	11	10	9	7
Kentucky	9	5	7	11	2
Louisiana	20	16	20	29	13
Maine	20	18	18	18	13
Maryland	10	10	10	25	5
Massachusetts	6	4	4	7	1
Michigan	21	20	20	26	17
Minnesota	6	9	7	9	4
Mississippi	30	22	26	22	4
Missouri	9	7	8	11	4
Montana	9	8	10	13	7
Nebraska	8	7	7	9	8
Nevada	6	0	0	28	11
New Hampshire	5	7	4	12	4
New Jersey	20	7	3	16	8
New Mexico	14	8	8	9	23
New York	5	6	5	12	8
North Carolina	22	23	22	36	13
North Dakota	21	12	14	10	5
Ohio	9	7	7	9	5
Oklahoma	11	8	8	25	9
Oregon	17	11	14	30	12
Pennsylvania	13	13	12	14	8
Rhode Island	9	9	9	14	5
South Carolina	32	27	23	32	3
South Dakota	19	14	15	18	11
Tennessee	23	18	19	19	2
Texas	29	21	24	25	34
Utah	37	30	25	43	11
Vermont	10	7	6	11	3
Virginia	15	12	16	48	8
Washington	22	18	18	24	21
West Virginia	4	8	4	18	4
Wisconsin	6	6	5	16	3
Wyoming	8	8	11	8	3

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School District Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

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Table 8 – Supply and Demand Indicators

Rates of and Reasons for Public School Teacher Attrition

	% of teachers who moved or left teaching[1]		Of those who moved or left		% of Teachers Over 50 Years of Age[2]
	% who moved to another school	% who left teaching	% who retired	% who left due to dissatisfaction, salary, or career change	
U.S. Average	7.3	5.1	13.6	50.2	24.8
Alabama	6.0	4.1	24.4	61.3	20.2
Alaska	14.6	9.5	5.4	45.1	18.1
Arizona	4.4	4.8	8.8	45.2	22.7
Arkansas	6.6	4.7	4.7	57.2	19.6
California	8.4	7.2	21.2	40.2	33.0
Colorado	4.2	7.4	15.3	84.8	25.8
Connecticut	14.4	3.1	—	—	28.4
Delaware	4.7	10.9	51.0	36.5	24.6
District of Columbia	—	—	—	—	41.4
Florida	9.1	5.9	7.3	41.3	25.0
Georgia	7.7	4.6	7.9	65.4	20.7
Hawaii	24.8	2.1	1.4	20.9	28.2
Idaho	3.8	3.5	13.6	53.0	20.5
Illinois	5.9	4.4	11.0	50.1	24.3
Indiana	6.7	2.7	10.9	15.9	25.7
Iowa	4.6	4.5	20.1	70.4	26.4
Kansas	15.8	4.7	8.9	43.0	23.2
Kentucky	5.9	3.4	11.7	57.0	16.7
Louisiana	6.4	8.1	26.4	53.9	21.1
Maine	3.4	2.8	12.3	53.3	25.0
Maryland	7.5	14.5	—	—	22.7
Massachusetts	8.0	3.9	7.9	18.2	28.8
Michigan	2.7	2.5	17.0	48.2	30.1
Minnesota	6.3	3.4	9.3	61.5	27.7
Mississippi	5.0	3.6	16.5	54.8	21.7
Missouri	8.3	5.9	15.3	53.8	20.9
Montana	10.2	2.7	6.1	50.5	19.5
Nebraska	4.2	5.5	13.9	46.4	21.4
Nevada	29.0	1.5	1.1	79.2	25.5
New Hampshire	—	—	—	—	23.2
New Jersey	4.6	2.7	7.5	29.9	34.2
New Mexico	10.5	3.6	10.1	51.7	21.7
New York	4.4	6.1	29.1	47.4	27.5
North Carolina	8.1	5.6	10.8	62.2	20.0
North Dakota	3.5	2.4	9.5	33.8	19.5
Ohio	5.0	5.8	31.2	54.1	22.5
Oklahoma	7.2	3.4	14.5	79.2	18.8
Oregon	6.6	3.6	18.0	46.9	26.8
Pennsylvania	10.2	3.7	12.7	36.9	26.1
Rhode Island	—	—	—	—	23.5
South Carolina	12.3	8.4	2.2	45.5	18.8
South Dakota	1.1	13.1	2.5	14.9	21.0
Tennessee	5.3	5.7	24.8	35.0	25.4
Texas	8.2	4.4	9.0	79.6	20.6
Utah	1.0	4.1	24.4	38.9	28.1
Vermont	—	—	—	—	23.8
Virginia	8.8	7.5	17.7	40.6	21.8
Washington	8.3	5.7	12.1	43.1	24.4
West Virginia	21.3	3.1	0.4	26.3	21.8
Wisconsin	8.1	4.3	5.1	55.7	26.4
Wyoming	6.5	3.0	13.1	81.5	23.5

— Too few cases for reliable estimate

1 Source: National Center for Education Statistics, 1993-94 Schools and Staffing Surveys (Teacher Follow-Up Survey, 1991-92). Tabulations conducted by the National Commission on Teaching & America's Future. 2 Source: National Center for Education Statistics, *America's Teachers : Profile of a Profession, 1993-94*, Table A2.9

Table 9 – Public School Teacher Salaries and Satisfaction with Teaching

	Salary Range[1]		Satisfaction with Teaching		
	Bachelor's degree, no experience	Highest step on schedule	% who would certainly become a teacher again[2]	% who plan to stay in teaching as long as they are able[2]	% of teachers satisfied with class size[3]
U.S. Average	21,923	40,517	38.0	32.6	64.5
Alabama	22,263	32,840	39.8	28.4	67.3
Alaska	31,374	58,095	46.2	31.5	68.9
Arizona	21,890	40,661	36.5	33.3	60.5
Arkansas	19,603	29,685	33.4	29.1	78.8
California	24,404	46,272	39.7	38.2	42.5
Colorado	19,937	37,316	38.2	35.7	64.6
Connecticut	28,195	56,189	45.8	39.1	76.4
Delaware	22,914	47,743	35.5	33.6	57.7
District of Columbia	22,000	54,000	38.5	26.5	69.9
Florida	21,838	39,599	32.0	34.1	51.7
Georgia	20,065	42,134	40.7	28.3	69.8
Hawaii	25,436	49,199	35.0	29.6	61.2
Idaho	18,102	33,128	39.3	28.6	58.7
Illinois	21,415	42,004	43.4	34.2	68.8
Indiana	22,560	41,993	39.4	35.3	67.6
Iowa	18,796	33,317	37.7	27.7	67.4
Kansas	22,714	36,671	34.2	30.9	74.9
Kentucky	21,135	36,743	32.5	25.3	69.3
Louisiana	18,045	30,539	30.3	33.5	63.5
Maine	19,566	36,814	37.7	36.2	75.3
Maryland	24,833	48,158	29.7	32.3	63.9
Massachusetts	23,108	44,783	40.9	36.9	67.1
Michigan	24,705	48,315	43.9	31.8	66.4
Minnesota	21,965	38,638	40.7	34.8	53.8
Mississippi	19,008	32,693	36.0	29.8	68.1
Missouri	18,158	28,222	34.6	29.6	62.3
Montana	17,801	33,755	38.5	31.9	77.1
Nebraska	17,781	32,281	36.2	29.8	79.1
Nevada	24,220	44,958	44.6	37.7	59.8
New Hampshire	21,317	38,971	39.7	35.3	65.8
New Jersey	28,424	58,208	47.3	40.7	67.8
New Mexico	22,114	35,994	33.2	30.1	67.8
New York	27,441	59,116	43.1	38.1	67.9
North Carolina	20,077	38,733	25.5	17.3	54.5
North Dakota	16,624	27,371	34.0	30.3	73.9
Ohio	20,550	42,152	41.1	29.0	68.9
Oklahoma	22,157	30,445	37.5	31.1	79.6
Oregon	20,708	35,962	32.9	27.2	59.4
Pennsylvania	26,341	50,337	42.1	37.1	63.0
Rhode Island	23,423	46,016	41.3	38.3	68.9
South Carolina	20,354	41,766	31.4	24.0	67.4
South Dakota	17,895	27,617	38.2	31.3	77.7
Tennessee	21,348	34,650	32.8	31.2	61.0
Texas	19,011	32,358	32.6	30.4	73.5
Utah	18,740	34,900	35.4	34.4	42.5
Vermont	20,918	40,330	39.6	35.8	72.6
Virginia	23,098	38,328	36.1	33.6	65.2
Washington	21,441	44,892	40.4	28.1	60.7
West Virginia	21,466	36,378	33.6	29.3	72.2
Wisconsin	23,080	42,995	41.0	27.0	67.3
Wyoming	20,137	38,701	37.6	30.4	77.6

1 Source: National Center for Education Statistics, *America's Teachers: Profile of a Profession, 1993-94*, Table A6.2. 2 Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey, (Public School Teacher Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future. 3 Source: National Center for Education Statistics, *America's Teachers: Profile of a Profession, 1993-94*, Table A4.8.

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Table 10 – Public School Teachers' Working Conditions: Teaching Loads

	Pupil-Teacher Ratio[1]	Average Class Size[2]	Secondary Teachers[3]		
			Average # of subject areas taught	Average # of periods taught per week	Average # of students taught
U.S. Average	17.3	23.5	1.8	5.4	123.5
Alabama	17.2	23.1	1.8	5.3	124.1
Alaska	17.6	22.0	2.6	5.5	115.5
Arizona	19.3	25.5	1.8	5.4	134.1
Arkansas	17.1	21.0	1.8	5.6	115.9
California	24.0	28.8	1.9	5.2	148.5
Colorado	18.4	24.5	2.0	5.2	127.8
Connecticut	14.1	20.0	1.7	5.4	104.3
Delaware	16.6	22.9	1.7	5.7	131.2
District of Columbia	13.2	21.0	1.4	5.2	106.5
Florida	19.1	26.3	1.7	5.3	136.7
Georgia	16.3	23.1	1.8	5.1	121.8
Hawaii	17.9	22.5	1.8	5.3	117.7
Idaho	19.1	24.1	2.1	5.2	120.2
Illinois	17.3	23.4	1.9	5.3	123.7
Indiana	17.5	22.4	1.8	5.2	117.6
Iowa	15.7	21.8	1.9	5.8	120.6
Kansas	15.1	20.5	2.0	5.3	107.9
Kentucky	17.0	23.0	1.8	5.2	119.8
Louisiana	16.6	22.4	1.9	5.5	128.1
Maine	13.8	19.8	1.9	6.0	105.3
Maryland	17.0	25.6	1.7	5.2	125.4
Massachusetts	14.8	21.9	1.8	5.6	115.3
Michigan	20.1	25.5	1.9	5.1	126.4
Minnesota	17.5	25.5	1.8	5.0	128.1
Mississippi	17.5	22.6	1.5	5.1	113.3
Missouri	15.5	23.1	1.8	5.5	121.8
Montana	16.3	20.1	2.1	5.6	104.9
Nebraska	14.5	19.7	2.1	5.8	105.3
Nevada	18.7	25.9	2.0	5.5	143.4
New Hampshire	15.6	21.2	1.8	5.1	103.0
New Jersey	13.8	21.2	1.8	5.6	109.3
New Mexico	17.2	22.6	2.0	5.3	123.5
New York	15.2	22.7	1.6	5.5	123.5
North Carolina	16.2	23.1	1.7	5.2	115.0
North Dakota	15.3	20.4	2.2	5.3	104.7
Ohio	16.6	22.8	1.8	5.6	124.1
Oklahoma	15.5	21.3	2.1	5.5	109.7
Oregon	19.9	24.4	2.1	5.3	125.8
Pennsylvania	17.1	23.8	1.7	6.1	143.6
Rhode Island	14.7	21.3	1.8	5.6	114.0
South Carolina	16.4	22.0	1.7	5.1	113.7
South Dakota	14.4	21.0	2.2	5.4	109.5
Tennessee	18.6	24.7	1.8	5.0	125.0
Texas	15.7	21.9	1.7	5.2	114.9
Utah	24.3	28.1	1.9	5.7	160.2
Vermont	13.8	19.5	1.9	5.3	97.6
Virginia	14.6	21.1	1.6	4.9	102.6
Washington	20.2	26.6	2.1	5.3	131.6
West Virginia	14.8	22.5	1.9	5.6	123.8
Wisconsin	15.9	22.9	1.7	5.5	122.5
Wyoming	15.0	20.3	2.1	5.6	105.8

1 Source: National Center for Education Statistics, *America's Teachers: Profile of a Profession, 1993-94*, Table 65. **2** Source: National Center for Education Statistics, *America's Teachers: Profile of a Profession, 1993-94*, Table A4.8. **3** Source: National Center for Education Statistics, *America's Teachers: Profile of a Profession, 1993-94*, Table A4.13.

Table 11 – Professional Working Conditions:

Teacher Influence Over Classroom Decisions

	Percentage of Public School Teachers Who Report Influence over Specific Classroom Decisions				
	Textbooks	Teaching Content	Teaching Techniques	Grading	Discipline
U.S Average	55	61	86	87	69
Alabama	44	52	84	87	63
Alaska	60	68	91	90	72
Arizona	55	59	87	88	72
Arkansas	61	57	84	85	64
California	47	58	87	90	78
Colorado	71	69	91	89	75
Connecticut	55	53	80	88	77
Delaware	53	66	87	87	65
District of Columbia	53	59	84	92	61
Florida	46	57	86	87	62
Georgia	46	51	86	86	62
Hawaii	66	77	92	93	76
Idaho	58	70	89	89	74
Illinois	59	68	88	88	74
Indiana	59	69	89	90	67
Iowa	67	74	92	90	76
Kansas	64	71	88	88	75
Kentucky	66	77	82	82	62
Louisiana	41	50	85	85	66
Maine	74	73	91	90	80
Maryland	41	41	75	80	66
Massachusetts	62	63	86	86	74
Michigan	61	66	89	88	71
Minnesota	67	72	92	90	75
Mississippi	51	54	86	85	64
Missouri	64	66	89	89	67
Montana	69	72	90	88	73
Nebraska	72	74	90	90	80
Nevada	59	63	91	91	72
New Hampshire	68	68	91	89	80
New Jersey	55	55	82	88	75
New Mexico	62	70	92	87	67
New York	60	57	87	87	70
North Carolina	45	44	80	82	62
North Dakota	67	76	89	87	78
Ohio	55	56	87	88	68
Oklahoma	66	67	90	90	65
Oregon	63	71	91	88	68
Pennsylvania	57	61	89	88	68
Rhode Island	52	61	89	87	78
South Carolina	47	66	82	85	57
South Dakota	71	73	91	89	81
Tennessee	43	54	87	87	70
Texas	50	57	83	80	59
Utah	51	58	87	90	73
Vermont	85	78	91	87	76
Virginia	46	53	84	83	64
Washington	60	66	91	88	69
West Virginia	48	61	87	87	70
Wisconsin	68	72	91	91	77
Wyoming	69	73	91	89	76

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Survey (Public School Teacher Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

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Table 12 – Professional Working Conditions:

Teacher Influence Over School Decisions

	% of Public School Teachers Who Report Influence Over Specific School Decisions						% who reported that following school rules conflicts with professional judgment
	Discipline Policies	Content of Inservice Programs	Teacher Hiring	Budget	Teacher Evaluation	Curriculum Content	
U.S. Average	35	31	8	8	3	34	24
Alabama	30	31	2	2	2	25	28
Alaska	44	34	8	8	3	36	24
Arizona	39	30	14	14	3	34	24
Arkansas	27	28	4	4	2	29	25
California	46	36	11	11	2	38	21
Colorado	48	37	29	29	5	45	22
Connecticut	33	36	7	7	3	36	25
Delaware	27	22	6	6	2	32	28
District of Columbia	30	30	2	2	3	23	40
Florida	34	34	9	9	4	31	25
Georgia	31	35	6	6	1	24	26
Hawaii	40	33	6	6	4	45	24
Idaho	43	29	8	8	2	41	20
Illinois	36	30	6	6	4	37	25
Indiana	32	31	3	3	3	37	21
Iowa	40	27	6	6	2	46	21
Kansas	41	29	8	8	3	41	17
Kentucky	40	43	17	17	2	41	23
Louisiana	35	25	4	4	3	20	27
Maine	45	41	10	10	3	45	22
Maryland	25	23	6	6	2	17	31
Massachusetts	27	21	7	7	4	34	25
Michigan	41	35	7	7	3	41	21
Minnesota	46	36	15	15	4	47	19
Mississippi	31	33	2	2	4	22	26
Missouri	30	40	4	4	2	45	24
Montana	44	36	6	6	2	53	23
Nebraska	40	24	5	5	2	46	15
Nevada	37	27	5	5	1	28	19
New Hampshire	39	33	15	15	4	52	24
New Jersey	23	23	1	1	2	33	28
New Mexico	37	28	14	14	4	38	29
New York	30	25	11	11	3	29	30
North Carolina	33	34	4	4	2	23	25
North Dakota	43	28	3	3	2	42	19
Ohio	30	32	5	5	3	32	20
Oklahoma	31	45	4	4	2	33	22
Oregon	45	30	12	12	2	46	22
Pennsylvania	32	20	2	2	1	35	26
Rhode Island	30	27	3	3	3	33	24
South Carolina	27	27	6	6	5	33	24
South Dakota	46	37	4	4	3	49	21
Tennessee	36	28	4	4	3	22	23
Texas	29	27	13	13	3	31	27
Utah	49	30	10	10	5	36	19
Vermont	56	43	18	18	5	59	25
Virginia	30	24	5	5	1	27	23
Washington	49	44	19	19	3	46	22
West Virginia	39	33	2	2	3	30	22
Wisconsin	42	36	9	9	1	49	22
Wyoming	44	29	15	15	2	49	21

Source: National Center for Education Statistics, 1993-94 Schools and Staffing Surveys (Public School Questionnaire). Tabulations conducted by the National Commission on Teaching & America's Future.

Appendix C
NCATE, INTASC, and National Board Standards

When people seek help from doctors, lawyers, accountants, engineers, or architects, they rely on the unseen work of a three-legged stool supporting professional competence: accreditation, licensing, and certification. In most professions, candidates must graduate from an accredited professional school that provides up-to-date knowledge and effective training in order to sit for the state licensing examinatons that test whether they have learned what they need to know to be responsible practitioners. In addition, many professions offer examinations that recognize advanced levels of skill, such as board certification for doctors, public accountants, and architects. Those who meet these standards are then allowed to do certain kinds of work that others cannot. The standards are also used to improve professional education and to set standards of practice for the work of the profession.

Until recently, teaching has not had a coherent set of standards created by the profession to guide education, entry into the field, and ongoing practice. In the last ten years, such standards have been created by three bodies working together to improve teaching: the National Council for the Accreditation of Teacher Education (NCATE) which sets standards for schools of education, the Interstate New Teacher Assessment and Support Consortium (INTASC)—a group of more than 30 states working to develop standards for the licensing of beginning teachers—and the National Board for Professional Teaching Standards, which sets standards for accomplished practice and offers advanced certificates. These standards are aligned with one another and with new standards for student learning in the disciplines, and they are tied to performance-based assessments of teacher knowledge and skill. The assessments look at evidence of teaching ability (videotapes of teaching, lesson plans, student work, analyses of curriculum) in the context of real teaching. States are just beginning to incorporate these standards into their policies governing teaching.

What do the standards require? To be accredited by NCATE, a teacher education program must:

- offer a coherent program of studies based on a knowledge base about effective teaching, rather than a collection of courses based on what professors want to teach;
- provide a full foundation in the liberal arts and in the discipline to be taught;
- prepare candidates to teach children so that they can achieve student learning standards in the disciplines;
- prepare teachers who can work with diverse learners and with new technologies;
- ensure that candidates gain knowledge of effective learning and teaching strategies as described in the INTASC standards and demonstrate their skills in working with students.

The INTASC standards for teacher licensing further spell out the competencies beginning teachers should have. These include:

- knowledge of subject matter and how to teach it to students;
- understanding of how to foster learning and development and how to address special learning needs;
- ability to assess students, plan curriculum, and use a range of teaching strategies that develop high levels of student performance;
- ability to create a positive, purposeful learning environment;
- ability to collaborate with parents and colleagues to support student learning and to evaluate the effects of one's own teaching in order to continually improve it.

The National Board standards for accomplished practice are used to guide assessments of veteran teachers. They outline detailed standards in 30 areas defined by subject area and developmental level of students (e.g. Early Adolescence Mathematics). The standards reflect these 5 propositions:

- Teachers are committed to students and their learning. National Board-Certified teachers are dedicated to ensuring their students' success. They understand how students develop and learn, and they adjust their practice based on student needs.
- Teachers know the subjects they teach and how to teach those subjects to students. Teachers use their deep understanding of subject matter to make it accessible to students.
- Teachers are responsible for managing and monitoring student learning. Teachers use their range of instructional techniques when each is appropriate. They know how to motivate and engage students, assess their learning, and explain student performance to parents.
- Teachers think systematically about their practice and learn from experience. National Board-Certified teachers critically examine their practice, seek advice from others, and use research to improve their teaching.
- Teachers are members of learning communities. They work collaboratively with parents and other professionals on behalf of students.

Meeting the INTASC and National Board standards requires both written assessments of subject matter and teaching knowledge and performance assessments of actual teaching in the classroom, including the development of a portfolio of lesson plans, student work, videotapes of teaching, and analyses of teaching decisions. The process is itself educational. As Shirley Bzdewka of Dayton, New Jersey described the effect of pursuing Board certification:

I'm a very different teacher now. I am much more focused. I can never, ever do anything again with my kids and not ask myself, "Why am I doing this? What are the effects on my kids? What are the benefits to my kids? It's not that I didn't care about those things before, but it's on such a conscious level now."

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